2011

SOUTH CAROLINA AQUATIC PLANT MANAGEMENT PLAN

Prepared by the
Aquatic Nuisance Species Program
South Carolina Department of Natural Resources
and Approved by the
South Carolina Aquatic Plant Management Council
2011

2011 SOUTH CAROLINA
AQUATIC PLANT MANAGEMENT COUNCIL

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Clemson University, Department of Pesticide Regulation

Appointment Pending-
Governor's Office

PART II - 2011 ANNUAL MANAGEMENT PLAN

INTRODUCTION

The Annual Management Plan for 2011 was developed by application of the procedures described in the Aquatic Plant Management Plan, Part I (Procedural Management Plan). The phases of development of the Annual Management Plan include l) identification of areas where aquatic plants interfere with water use, 2) development of a description of each problem area, 3) development of a management strategy for each problem area, and 4) determination of the distribution of available funding among problem areas.

Common and Scientific Names of Aquatic Plants Referenced in the Plan

Alligatorweed	*Alternanthera philoxeroides*
Bladderwort	*Utricularia spp.*
Brazilian elodea	*Egeria densa*
Bur Marigold	*Bidens spp.*
Cowlily	*Nuphar luteum macrophyllum*
Cattails	*Typha spp.*
Coontail	*Ceratophyllum demersum*
Creeping rush	*Juncus repens*
Curly-leaf pondweed	*Potamogeton crispus*
Duckweed	*Lemna spp*.
Eurasian watermilfoil	*Myriophyllum spicatum*
Fanwort	*Cabomba caroliniana*
Filamentous algae	*Pithophora, Lyngbya, Hydrodictyon*
Floating bladderwort	*Utricularia inflata*
Floating heart	*Nymphoides spp*.
Frog's bit	*Limnobium spongia*
Giant cutgrass	*Zizaniopsis miliacea*
Hydrilla	*Hydrilla verticillata*
Lotus	*Nelumbo lutea*
Musk-grass	*Chara*
Pondweed	*Potamogeton spp*.
Common reed	*Phragmites australis*
Slender naiad	*Najas minor*
Smartweed	*Polygonum densiflorum*
Southern naiad	*Najas guadalupensis*
Spikerush	*Eleocharis spp.*
Stonewort	*Nitella*
Variable-leaf pondweed	*Potamogeton diversifolius*
Waterlily	*Nymphaea odorata*
Water hyacinth	*Eichhornia crassipes*
Water lettuce	*Pistia stratiotes*
Watermilfoil	*Myriophyllum spp.*
Water pennywort	*Hydrocotyle ranunculoides*
Water primrose	*Ludwigia hexapetala*
Watershield	*Brasenia schreberi*

Aquatic Plant Problem Areas

Areas where aquatic plants interfere with water use were identified from information provided by S.C. Aquatic Plant Management Council members, an aquatic plant survey conducted by the S.C. Department of Natural Resources staff and public input. The identified problem areas listed below are open to access and use by the public and are therefore considered by the Council as eligible for some type of public funding. Acres of infestation (coverage) are approximations based on observations made in 2010

SPECIAL NOTE: Due to 2011 budget problems and in an effort to continue to serve all of the areas around the state; each water body will only be eligible for up to $40,000 of cost share money from the SCDNR.

1) Water body - Back River Reservoir
   Location - Berkeley County
   Surface acres - 850
   Aquatic plants - Hydrilla, Water hyacinth, Water primrose, Fanwort
   Coverage - 360 acres
   Impaired activities- Boating, fishing, hunting, swimming, industrial water supply, municipal water supply, electric power generation, public access
2) Water body - Baruch Institute
   Location - Georgetown County
   Surface acres - Unknown, adjacent to Winyah Bay
   Aquatic plants - Phragmites
   Coverage - 25 acres
   Impaired activities - Boating, hunting, fishing, public access
3) Water body - Black Mingo Creek
   Location - Georgetown County
   Surface acres -Unknown
   Aquatic plants - Alligatorweed, Parrot feather
   Coverage - 5 acres
   Impaired activities - Boating, hunting, fishing, public access
4) Water body - Black River
   Location - Georgetown County
   Surface acres -Unknown
   Aquatic plants - Alligatorweed
   Coverage – 10 acres
   Impaired activities - Boating, hunting, fishing, public access
5) Water body - Bonneau Ferry
   Location - Berkeley County
   Surface acres -Unknown - Multiple Reserves and impoundments
   Aquatic plants - Water hyacinth, Water primrose, Frog's bit, Lotus, Cat-tails, Cutgrass, Pennywort, Parrotfeather, Fanwort, Coontail
   Coverage - 40 acres

Impaired activities - Boating, hunting, fishing, public access

6) Water body – Boyd Pond
   Location - Aiken County
   Surface acres -21 acres
   Aquatic plants – Bladderwort, watermilfoil, water primrose
   Coverage - 15 acres
   Impaired activities - Boating, hunting, fishing, public access
7) Water Body – Caw Caw Interpretative Center
   Location – Charleston County
   Surface acres – unknown
   Aquatic plants - Hydrilla, Water primrose, Water hyacinth, Phragmites, Tallow
   Coverage - 10 acres
   Impaired activities – Recreational and public access
8) Water body - Combahee River (Borrow pit)
   Location - Colleton County
   Surface acres - approx. 5 acres
   Aquatic plants - Hydrilla, Water primrose, Water hyacinth
   Coverage - 4 acres
   Impaired activities - Boating, hunting, fishing, public access
9) Water body - Cooper River (and adjacent ricefields)
   Location - Berkeley County
   Surface acres - Unknown
   Aquatic plants - Hydrilla, Water primrose, Water hyacinth
   Coverage - approx. 2,800 acres
   Impaired activities - Boating, hunting, fishing, public access
10) Water body - Donnelley/Bear Island WMA
   Location - Colleton County
   Surface acres - Multiple impoundments and rivers
   Aquatic plants - Cutgrass, Frog's bit, Cattails, Phragmites
   Coverage - 40 acres
   Impaired activities - Hunting, public access
11) Water body - Dungannon Plantation Heritage Preserve
   Location - Charleston County
   Surface acres - Unknown
   Aquatic plants - Cutgrass, Frog's bit, Cattails, Water primrose, Swamp loosestrife
   Coverage - 14 acres
   Impaired activities - Wood stork nesting site, public access
12) Water body - Goose Creek Reservoir
   Location - Berkeley County
   Surface acres - 600
   Aquatic plants - Water hyacinth, Water lettuce, Water primrose, Hydrilla, Salvinia(Salvinia minima)

Coverage - 180 acres
Impaired activities - Boating, public access, industrial water supply, floodway

13) Water body – Lake Cunningham
Location - Greenville County
Surface acres -160 acres
Aquatic plants – Brazilian elodea, Water primrose, Waterlily spatterdock
Coverage – 10 acres
Impaired activities - Boating, hunting, fishing, public access

14) Water body - Lake Darpo
Location - Darlington County
Surface acres – 17.5 acres
Aquatic plants - Water lily, milfoil
Coverage - 12 acres
Impaired activities - Boating, swimming, fishing, vector control, public access

15) Water body - Lake Greenwood
Location -Laurens and Greenwood Counties
Surface acres - 11,400
Aquatic plants - Hydrilla, Slender naiad
Coverage - 25 acres
Impaired activities – Potential impacts to electric power generation, boating, swimming, vector control, public access

16) Water body - Lake Keowee
Location – Pickens and Oconee Counties
Surface acres – 18,300 acres
Aquatic plants - Hydrilla
Coverage - <10 acres
Impaired activities - Potential impacts to electric power generation, municipal water supply, boating, swimming, vector control, public access

17) Water body - Lake Murray
Location - Lexington and Richland Counties
Surface acres - 50,000
Aquatic plants - Hydrilla, Illinois pondweed, Water primrose, Alligatorweed
Coverage - 75 acres
Impaired activities - Boating, swimming, domestic and municipal water intakes, public access

18) Water body - Lake Wateree
Location – Kershaw County
Surface acres – 13,710 acres
Aquatic plants – Hydrilla, cutgrass
Coverage - <5 acres
Impaired activities - Potential impacts to boating, swimming, vector control, public access

19) Water body - Little Pee Dee River
Location - Marion and Horry Counties

Surface acres - Unknown
Aquatic plants - Alligatorweed
Coverage - 30 acres
Impaired activities - Boating, hunting, fishing, public access

20) Water body - Lumber River
Location - Marion and Horry Counties
Surface acres - Unknown
Aquatic plants - Alligatorweed
Coverage - 5 acres
Impaired activities - Boating, hunting, fishing, public access

21) Water body - Pee Dee River
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Water hyacinth, Phragmites
Coverage - 40 acres
Impaired activities - Boating, hunting

22) Water body - Samworth WMA
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Phragmites, Water hyacinth
Coverage - 50 acres
Impaired activities - Hunting, public access

23) Water body - Santee Coastal Reserve
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Phragmites
Coverage - 300 acres
Impaired activities - Hunting, public access

24) Water body - Santee Delta WMA
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Phragmites
Coverage - 50 acres
Impaired activities - Hunting, public access

25) Water body - US Army Corps of Engineers - Charleston Harbor/Intracoastal Waterway
Location - Charleston County
Surface acres - Unknown
Aquatic plants - Phragmites
Coverage – 200+ acres
Impaired activities - Boating, hunting, fishing, public access

26) Water body - US Naval Weapons Station
Location - Charleston and Berkeley Counties

Surface acres - Unknown
Aquatic plants - Frog's-bit, Water primrose, Water hyacinth, Phragmites
Coverage - 75 acres
Impaired activities - Boating, hunting, fishing, public access

27) Water body - Waccamaw River
Location - Georgetown and Horry Counties
Surface acres - Unknown
Aquatic plants - Water hyacinth, Phragmites
Coverage - 50 acres
Impaired activities - Boating, hunting, fishing, public access

28) Water body - Yawkey Wildlife Center
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Phragmites
Coverage - 25 acres
Impaired activities - Hunting, public access

Santee Cooper Lakes

29) Water body - Lake Marion
Location - Sumter, Clarendon, Calhoun, Berkeley, and Orangeburg Counties.
Surface acres - 110,000
Aquatic plants - Alligatorweed, Brazilian elodea, Hydrilla, Water primrose, Slender naiad, Coontail, Water hyacinth, Filamentous algae, Fanwort, Cutgrass, Crested floating heart
Coverage - 2350 acres
Impaired activities - Boating, swimming, public access, potential electric power generation, potential irrigation water withdrawals

30) Water body - Lake Moultrie
Location - Berkeley County
Surface acres - 60,400
Aquatic plants - Alligatorweed, Water primrose, Brazilian elodea, Hydrilla, Slender naiad, Water hyacinth, Watermilfoil, Fanwort, Cutgrass, Crested floating heart
Coverage - 400 acres
Impaired activities - Potential electric power generation, boating, swimming, public access, potential domestic and irrigation water withdrawals

SC Parks, Recreation and Tourism - State Park Lakes

31) Water body - Barnwell State Park
Location - Barnwell County
Surface acres - 12
Aquatic plants – Waterlily, Cattails
Coverage - 3 acres

Impaired activities - Fishing, swimming, aesthetics

32) Water body - Charles Towne Landing State Park
    Location - Charleston County
    Surface acres - 5
    Aquatic plants - Duckweed, Alligatorweed, Pennywort, Cyanobacteria, Algae
    Coverage - 4 acres
    Impaired activities - Fishing, tourism, aesthetics
33) Water body - H. Cooper Black Recreation Area
    Location - Chesterfield County
    Surface acres - 2 acres
    Aquatic plants - Spatterdock
    Coverage - 1 acres
    Impaired activities - Recreational activities
34) Water body - Huntington Beach SP
    Location - Horry County
    Surface acres - 15 acres
    Aquatic plants - Cutgrass, Phragmites, Cattails
    Coverage - 15 acres
    Impaired activities - Recreational activities
35) Water body - Kings Mountain State Park - Crawford Lake
    Location - York County
    Surface acres - 9
    Aquatic plants - Slender naiad
    Coverage - 4 acres
    Impaired activities - Swimming, boating
36) Water body - Little Pee Dee State Park
    Location - Dillon County
    Surface acres - 75
    Aquatic plants - Spikerush, Cowlily
    Coverage - 15 acres
    Impaired activities - Fishing, boating
37) Water body - N.R. Goodale State Park
    Location - Kershaw County
    Surface acres - 160 acres
    Aquatic plants - Waterlily, Watershield
    Coverage - 60 acres
    Impaired activities - Swimming, recreational activities
38) Water body - Sesquicentennial State Park
    Location - Richland County
    Surface acres - 25 acres
    Aquatic plants - Waterlily, Watershield
    Coverage - 12 acres

Impaired activities - Swimming, fishing

SC Department of Natural Resources - State Lakes

39) Water body - Lake Cherokee
    Location - Cherokee County
    Surface acres - 50 acres
    Aquatic plants - Water primrose
    Coverage - 5 acres
    Impaired activities - Boating, fishing
40) Water body - Lake Edwin Johnson
    Location - Spartanburg County
    Surface acres - 40 acres
    Aquatic plants - Water primrose, Hydrilla, Pondweed
    Coverage - 10 acres
    Impaired activities - Boating, fishing
41) Water body - Jonesville Reservoir
    Location - Union County
    Surface acres - 25 acres
    Aquatic plants - Water primrose, Pondweed
    Coverage - 10 acres
    Impaired activities - Boating, fishing
42) Water body - Mountain Lakes
    Location - Chester County
    Surface acres - 70 acres
    Aquatic plants - Water primrose, Alligatorweed, Parrotfeather
    Coverage - 5 acres
    Impaired activities - Boating, fishing
43) Water body - Lancaster Reservoir
    Location - Lancaster County
    Surface acres - 61 acres
    Aquatic plants - Water primrose, Alligatorweed
    Coverage - 8 acres
    Impaired activities - Boating, fishing, hunting
44) Water body - Sunrise Lake
    Location - Lancaster County
    Surface acres - 25 acres
    Aquatic plants - Pondweed
    Coverage - 15 acres
    Impaired activities - Boating, fishing
45) Water body - Lake Ashwood
    Location - Lee County

Surface acres - 75 acres
Aquatic plants - Waterlily
Coverage - spotty
Impaired activities - Boating, fishing

46) Water body - Lake Edgar Brown
Location - Barnwell County
Surface acres - 100 acres
Aquatic plants - Water primrose, Coontail
Coverage - 60 acres
Impaired activities - Boating, fishing

47) Water body - Lake George Warren
Location - Hampton County
Surface acres - 400 acres
Aquatic plants - Cattails, Water primrose, Coontail
Coverage - 20 acres
Impaired activities - Boating, fishing

48) Water body - Lake Thicketty
Location - Cherokee County
Surface acres - 100 acres
Aquatic plants - Hydrilla
Coverage - 5 acres
Impaired activities - Boating, fishing

South Carolina Border Lakes

49) Water body - Lake Wylie
Location – York County, SC; Gaston and Mecklenburg County, NC
Surface acres – 13,443 acres
Aquatic plants - Hydrilla
Coverage - 90 acres(all in NC waters)
Impaired activities - Potential impacts include electric power generation, boating, swimming, public access, domestic and irrigation water withdrawals

AQUATIC PLANT MANAGEMENT STRATEGY

The following management strategies were developed for each identified problem area considered eligible for public funding. Planned expenditures are based on known available federal funds, estimated state funds and anticipated local support as of the date of this plan. For water bodies in which final funding is inadequate to conduct all proposed control operations, the extent of control will be reduced and priority areas and target plants will be determined by the Department of Natural Resources in cooperation with the local sponsor. A summary of proposed expenditures for 2011 and a location map of problem water bodies are located at the end of this section.

SPECIAL NOTE: Due to continuing budget problems (in an effort to serve all of the areas around the state) each water body will only be eligible for up to $40,000 of cost share money from the SCDNR.

Public Waters

1. Back River Reservoir (Berkeley County)

Problem plant species

Hydrilla, Water hyacinth, Fanwort, Water primrose, Frog's bit, Cutgrass

Management objectives

Reduce water hyacinth and water primrose populations throughout the lake to enhance public access, navigation, water flow and minimize impacts to water intakes from floating islands.

Reduce hydrilla in upper Foster Creek area to improve water quality, water flow and navigation.

Reduce hydrilla and fanwort in 62.50 acre area adjacent to SCE&G Williams Station intake to enhance water flow, minimize clogging of water intake, and enhance public boating and fishing use in this area.

Reduce hydrilla and fanwort in a 2 acre area at Bushy Park Landing to enhance public boating and fishing use in this area.

Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Galleon SC, Habitat, Glyphosate
Water primrose, Cutgrass	Renovate 3, Reward, Habitat, Clearcast, Glyphosate
Hydrilla	Chelated copper*, Chelated copper*/Reward, Aquathol

May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

Area to which control is to be applied

Renovate 3, Reward, Habitat, Clearcast, Glyphosate and Galleon SC - 300 acres of water hyacinth, water primrose and cutgrass throughout the lake.

Chelated copper*/Reward, Galleon SC - 154 acres of hydrilla; 2 treatments of 62.50 acre area near SCE&G intake, 2 acres of hydrilla adjacent to Bushy Park Landing, 25 acres of hydrilla in Foster Creek arm (2 treatments-12.50 acres each).

Rate of control agents to be applied

Aquathol – 0.500 to 5 ppm

Renovate 3 - 0.500 - 0.750 gallons per acre.

Reward - 0.500 gallons per acre.

Clearcast - 0.250 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Chelated copper - up to 1 ppm (about 10- 16 gallons per acre).

Chelated copper*/Reward - 4 gallons/2 gallons per acre

Habitat – 0.250 - 0.750 gallons per acre.

Galleon SC - Submersed 0.174 fl oz/acre foot to achieve minimum effective concentration of 25 to 75 ppb, Floating species – 2 to 6 fl oz/acre as foliar application.

Method of application of control agents

Renovate 3, Reward, Habitat, Clearcast, Glyphosate and Galleon SC - spray on surface of foliage with appropriate surfactant.

Chelated copper, Chelated copper*/Reward, Aquathol - subsurface injection from airboat.

Timing and sequence of control application

Three hundred (300) acres of water hyacinths, water primrose and cutgrass treated with Renovate 3, Clearcast, Habitat, Glyphosate, Galleon SC (May-October), Reward (October, November). The initial treatments are to be followed in 1-2 days with a cleanup treatment.

12.50 acres of hydrilla in Foster Creek to be treated 2 times (April-October) with Aquathol.

Hydrilla and fanwort located adjacent to public boat ramp to be treated with chelated copper.

Hydrilla located near the SCE&G water intake to be treated periodically during the year with Chelated copper, Chelated copper*/diquat (up to three times in the same 62.50 acre area), treatment area may be expanded as control is realized in target are

Other control application specifications

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

All herbicide treatments conducted within 1600 feet of the CPW water intake will use Renovate 3 at a rate of 0.5 gallons per acre or less or Galleon SC at a rate of 2 to 6 oz/acre.

Reward treatments will be conducted at least 1600 feet from the intake. Following any application of Reward within 1600 feet of the CPW water intake, herbicide residue concentrations may be monitored according to a plan agreed to by the S.C. Department of Natural Resources, Charleston Commissioners of Public Works(CPW), and the Department of Health and Environmental Control.

If filamentous algae are present on submersed macrophytes, an algaecide, such as K-TEA, will be used in addition to selected herbicides to assist in control.

Control is to be applied in a manner that will not significantly degrade water quality in the treatment area. This may involve treating only a portion of the area at any one time.

Entity to apply control agents

Commercial applicator

Estimated cost of control operations

$52,082

Potential sources of funding

Water primrose and water hyacinths -

Charleston Commissioners of Public Works 30%

S.C. Electric and Gas Co. 20%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Hydrilla and Cabomba (near SCE&G intake) -

S.C. Electric and Gas Co. 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Hydrilla (Foster Creek, boat ramp, and Back River) -

Charleston Commissioners of Public Works 30%

S.C. Electric and Gas Co. 20%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

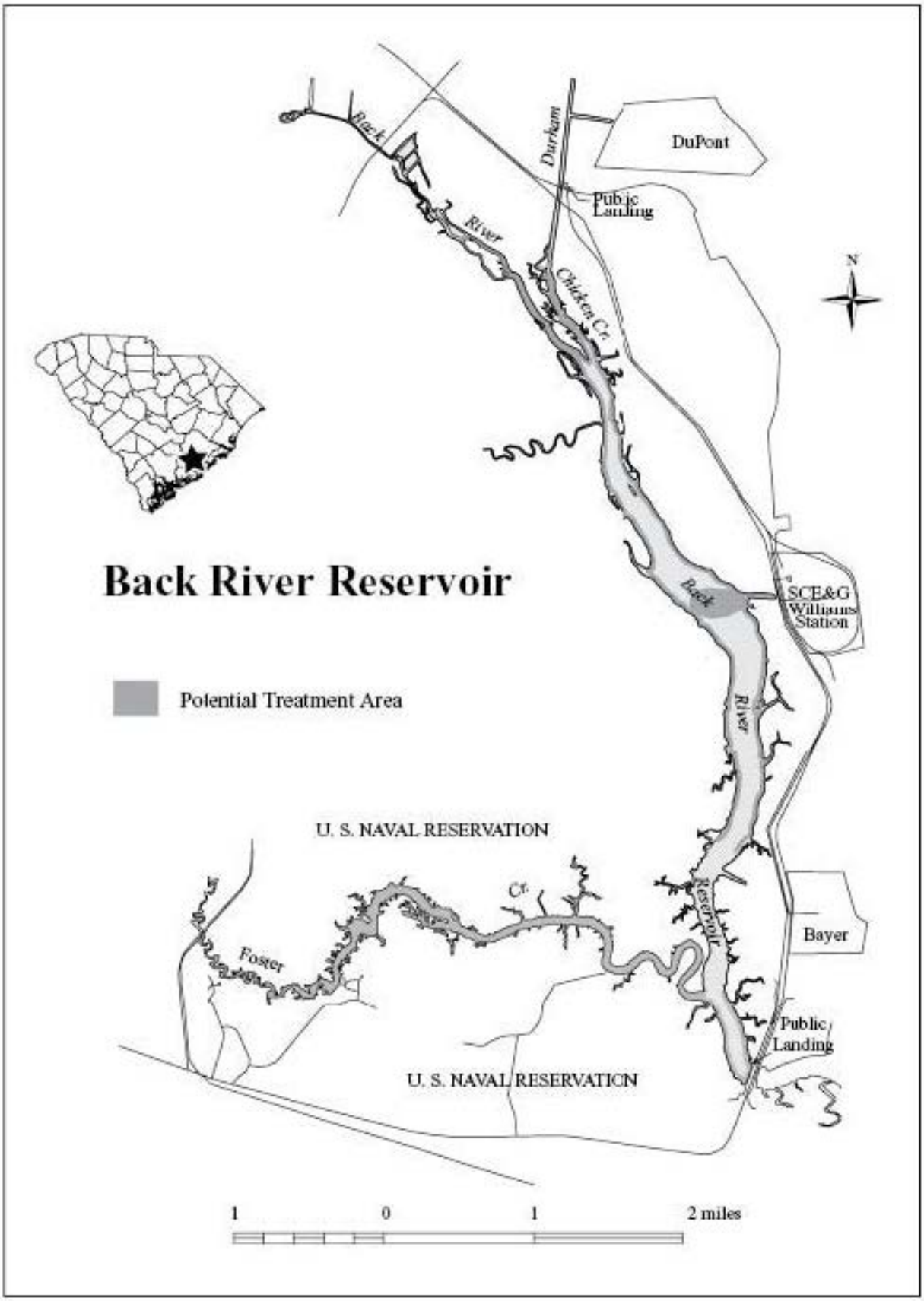
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Effective long term control of water hyacinth in the reservoir must also include control of this species in the Cooper River to which the reservoir is connected.


Back River Reservoir
Potential Treatment Area
Back
River
Durham
DuPont
Public Landing
Chicken Cr.
N
SCE&G Williams Station
U. S. NAVAL RESERVATION
Cr.
Foster
Reservoir
Bayer
Public Landing
U. S. NAVAL RESERVATION
1
0
1
2 miles

2. Baruch Institute (Georgetown County)

Problem plant species

Phragmites

Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible

Selected control method

Problem Species	Control Agent
Phragmites	Habitat, Glyphosate, Clearcast

Area to which control is to be applied

25 acres of phragmites throughout area

Rate of control agent to be applied

Habitat - 0.250 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Clearcast - up to 5 % solution for spot spray.

Method of application of control agent

Helicopter - 25 acres of Habitat, Glyphosate, Clearcast applied to phragmites.

Other applications - Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply when plants are actively growing (July - Oct.).

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$3,000

Potential sources of funding

Baruch Institute 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

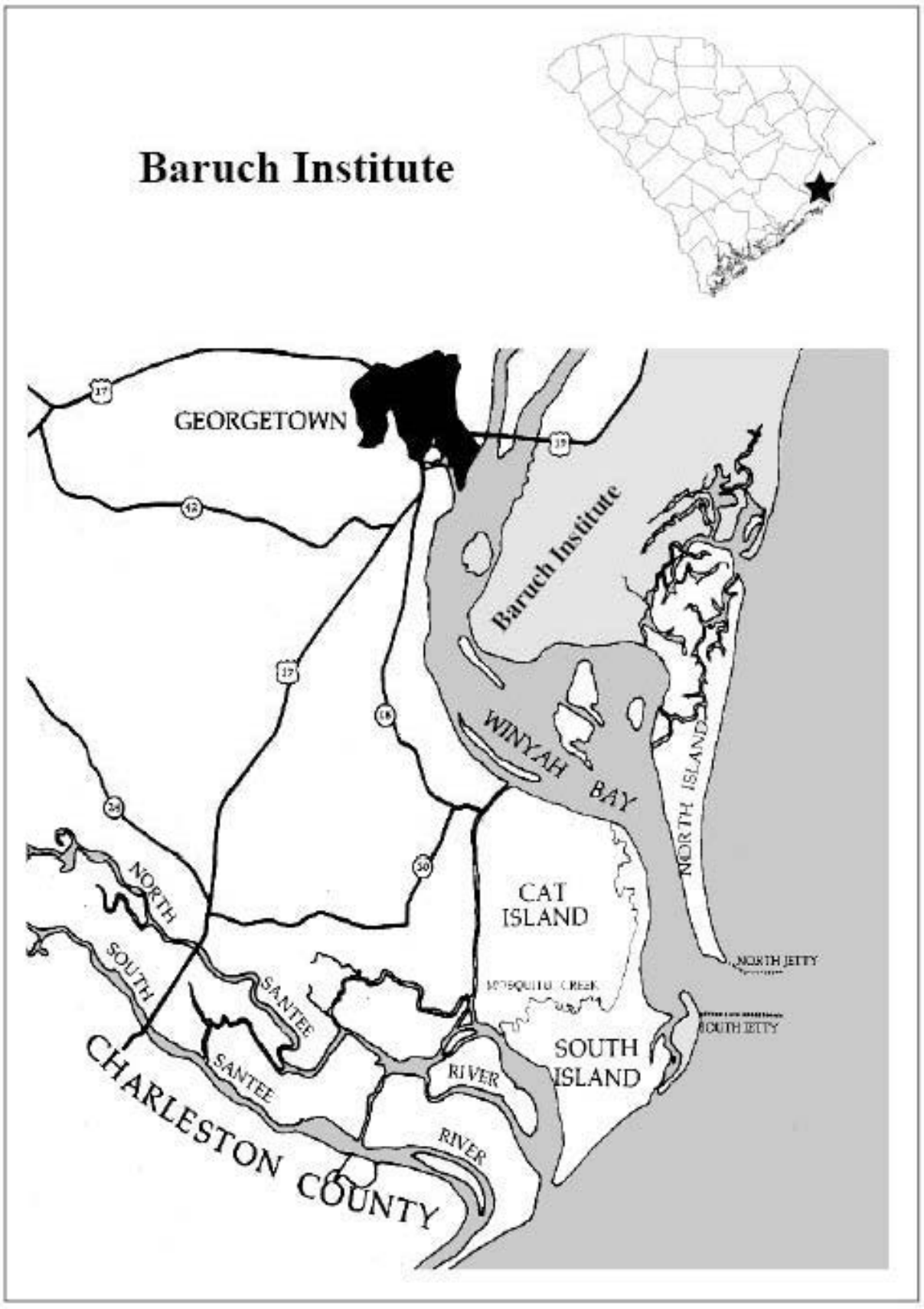
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Continue to coordinate treatment areas with local conservation groups.


Baruch Institute
GEORGETOWN
Baruch Institute
WINYAH BAY
NORTH ISLAND
CAT ISLAND
NORTH JETTY
SOUTH JETTY
SOUTH ISLAND
NORTH SANTEE RIVER
SOUTH SANTEE RIVER
CHARLESTON COUNTY

3. Black Mingo Creek (Georgetown County)

Problem plant species

Alligatorweed, Parrot feather, Frog's bit, Pennywort

Management objective

Reduce or remove nuisance weed infestation at public access points, the main river channel, and connecting lakes to improve water quality and navigation.

Selected control method

Problem Species	Control Agent
Alligatorweed, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC

Area to which control is to be applied

5acres of problematic plants throughout river

Rate of control agent to be applied

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 - 0.750 gallons per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$865

Potential sources of funding

Georgetown County 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

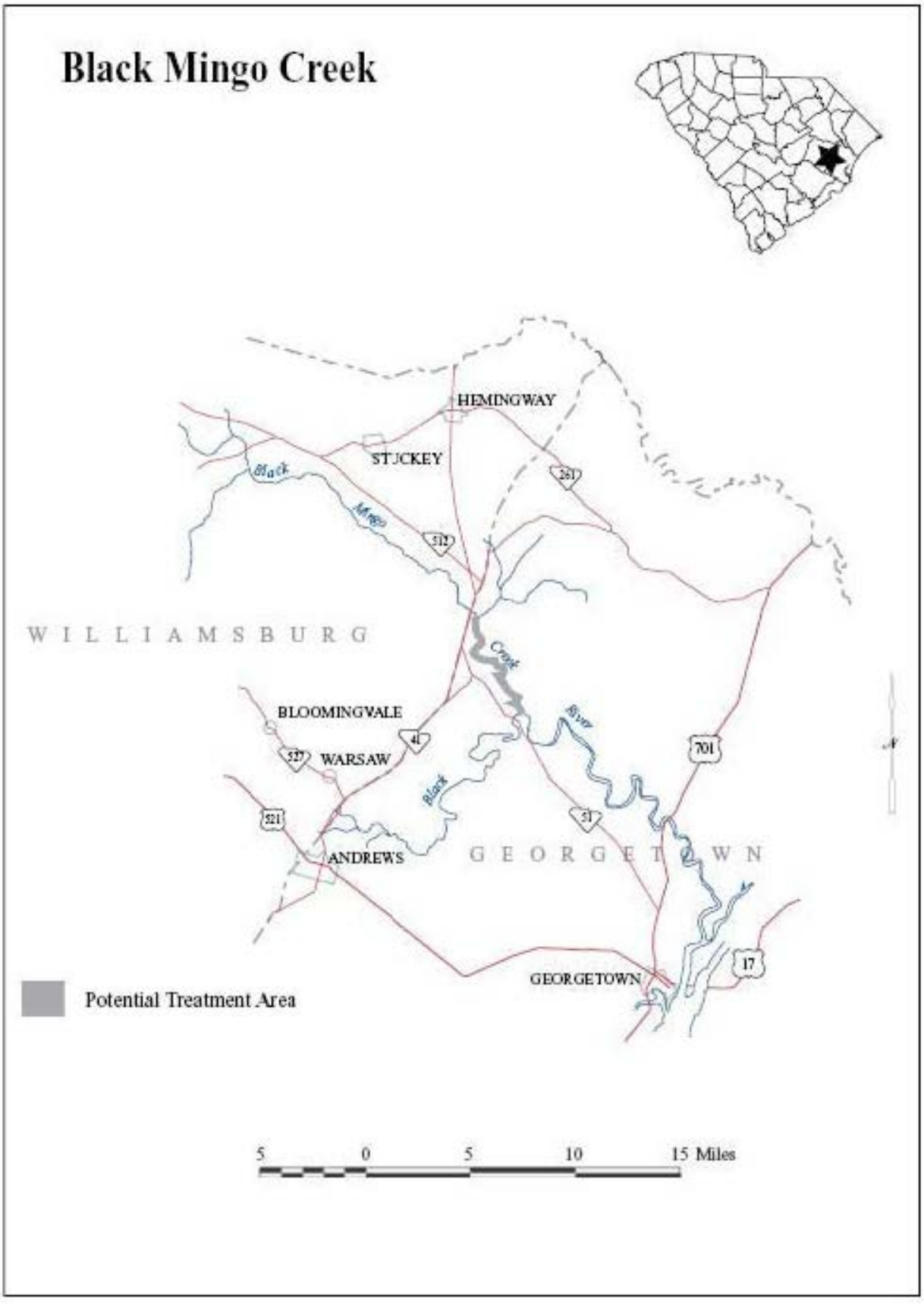
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Continue to coordinate treatment areas with local conservation groups.


Black Mingo Creek
HEMINGWAY
STUCKEY
Black
Mingo
261
512
WILLIAMSBURG
Creek
BLOOMINGVALE
41
527
WARSAW
Black
River
701
521
51
ANDREWS
GEORGETOWN
17
Potential Treatment Area
5 0 5 10 15 Miles

4. Black River (Georgetown County)

Problem plant species

Alligatorweed, Parrot feather, Frog's bit, Pennywort, Phragmites

Management objective

Reduce or remove nuisance weed infestation at public access points, the main river channel, and connecting lakes to improve water quality and navigation.

Selected control method

Problem Species	Control Agent
Alligatorweed, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC
Phragmites	Habitat, Clearcast

Area to which control is to be applied

40 acres of problematic plants throughout river

Rate of control agent to be applied

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 - 0.750 gallons per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$3,220

Potential sources of funding

Georgetown County 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

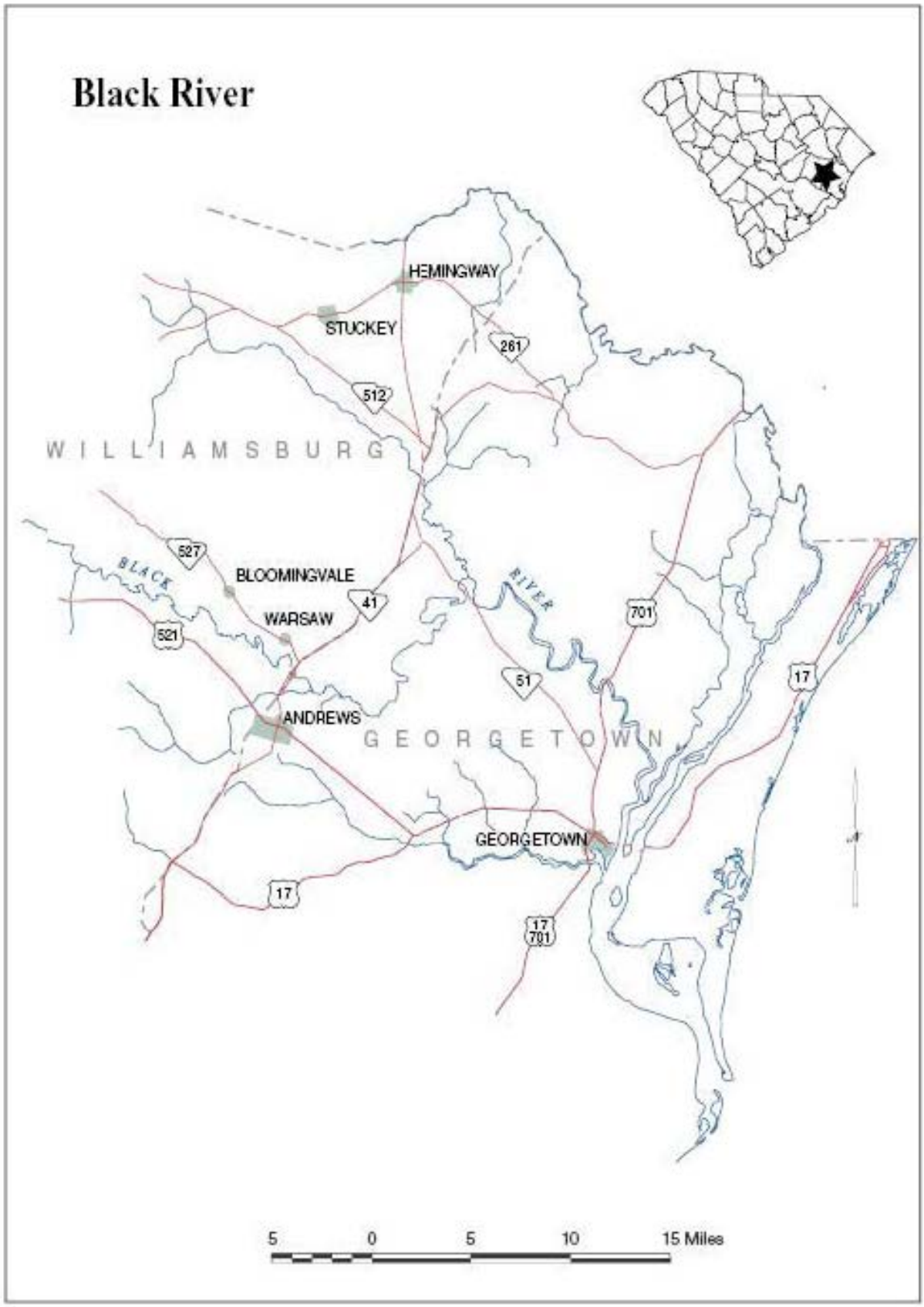
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.


Black River
HEMINGWAY
STUCKEY
261
512
WILLIAMSBURG
527
BLACK
BLOOMINGVALE
41
WARSAW
RIVER
701
521
51
17
ANDREWS
GEORGETOWN
GEORGETOWN
17
17
701
5 0 5 10 15 Miles

5. Bonneau Ferry (Berkeley County)

Problem plant species

Water Primrose, Water hyacinth, Cattails, Lotus, Cutgrass, Pennywort, Frog's bit, Parrotfeather

Management objective

Reduce nuisance plant populations to the greatest extent possible throughout Bonneau Ferry impoundments to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

Selected control method

Problem Species	Control Agent
Water primrose, Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate
Cattails, Cutgrass, Parrotfeather	Habitat, Clearcast, Glyphosate
Water hyacinth, Frog's bit	Renovate 3, Reward, Clearcast, and Galleon SC

Area to which control is to be applied

40 acres of problematic plants throughout the reserves and impoundments of Bonneau Ferry.

Rate of control agent to be applied

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 - 0.750 gallons per acre.

Clearcast - up to a 5% solution for spot spray.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application, submersed approximately 0.174 gallons/acre foot.

Method of application of control agent

Helicopter - 20 acres of Habitat, Glyphosate, Clearcast with appropriate surfactant.

Other applications - Spray on surface of foliage with appropriate surfactant from boat.

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$5,691

Potential sources of funding

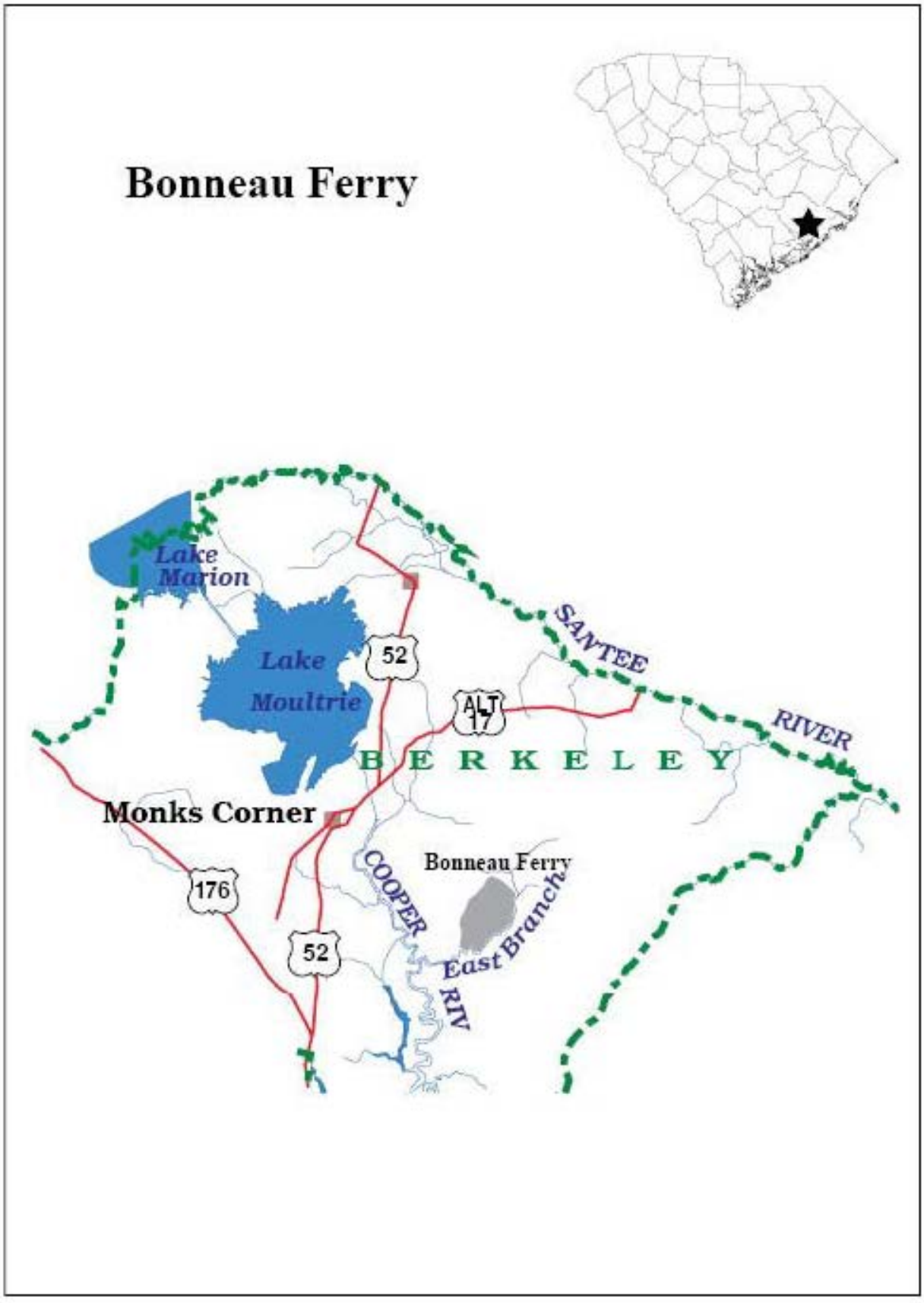
S.C. Department of Natural Resources 100%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.


Bonneau Ferry
Lake Marion
Lake Moultrie
52
ALT 17
SANTEE
RIVER
B E R K E L E Y
Monks Corner
176
52
COOPER
Bonneau Ferry
East Branch
RIV

6. Boyd Pond (Aiken County)

Problem plant species

Water milfoil, Bladderwort, Water primrose, Emergent grasses

Management objective

Reduce nuisance plant populations to the greatest extent possible throughout lake to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

Selected control method

Problem Species	Control Agent
Water milfoil, Bladderwort	Hardball, Clearcast, Reward, Renovate Max G
Water primrose,	Renovate 3, Habitat, Glyphosate, Clearcast
Emergent grasses	Renovate 3, Habitat, Glyphosate, Clearcast,

Area to which control is to be applied

15 acres of problematic plants throughout Boyd Pond.

Rate of control agent to be applied

Renovate 3 - 0.500 to 0.750 gallons per acre.
Renovate Max G – 200 lbs per acre.
Habitat - 2 to 3 pints per acre.
Clearcast - up to 5% solution for spot spray.
Glyphosate - up to 0.937 gallons per acre. Hardball - up to 5 gallons per acre.
Reward - up to 2 gallons per acre.

Method of application of control agent

Herbicides spray on surface of foliage with appropriate surfactant from boat or subsurface injection from airboat. Granular herbicides spread evenly using appropriate rate.

Timing and sequence of control application

Herbicide - Apply when plants are actively growing.

Other control application specifications

All herbicide applications are to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time. The submersed treatments will be divided into 2 or 3 different applications to avoid a Dissolved Oxygen problem.

Milfoil may require multiple treatments.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$4,961

Potential sources of funding

Aiken County 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.

Boyd Pond

7. Caw Caw Interpretative Center (Charleston County)

Problem plant species

Phragmites, milfoil, waterlily

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Problem Species	Control Agent
Water milfoil	Hardball, Renovate Max G, Clearcast
Waterlily,	Hardball, Habitat, Glyphosate, Clearcast
Phragmites	Habitat, Glyphosate, Clearcast,

Area to which control is to be applied

10 acres

Rate of control agent to be applied

Habitat - 2 to 3 pints per acre.
Renovate Max G – 200 lbs per acre.
Clearcast - up to 5% solution for spot spray.
Glyphosate - up to 0.937 gallons per acre. Hardball - up to 5 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant and subsurface injection from airboat. Granular herbicides spread evenly using appropriate rate.

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

Commercial applicator.

Estimated cost of control operations

$2,500

Potential sources of funding

Caw Caw Interpretative Center (Charleston Co. Parks) 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

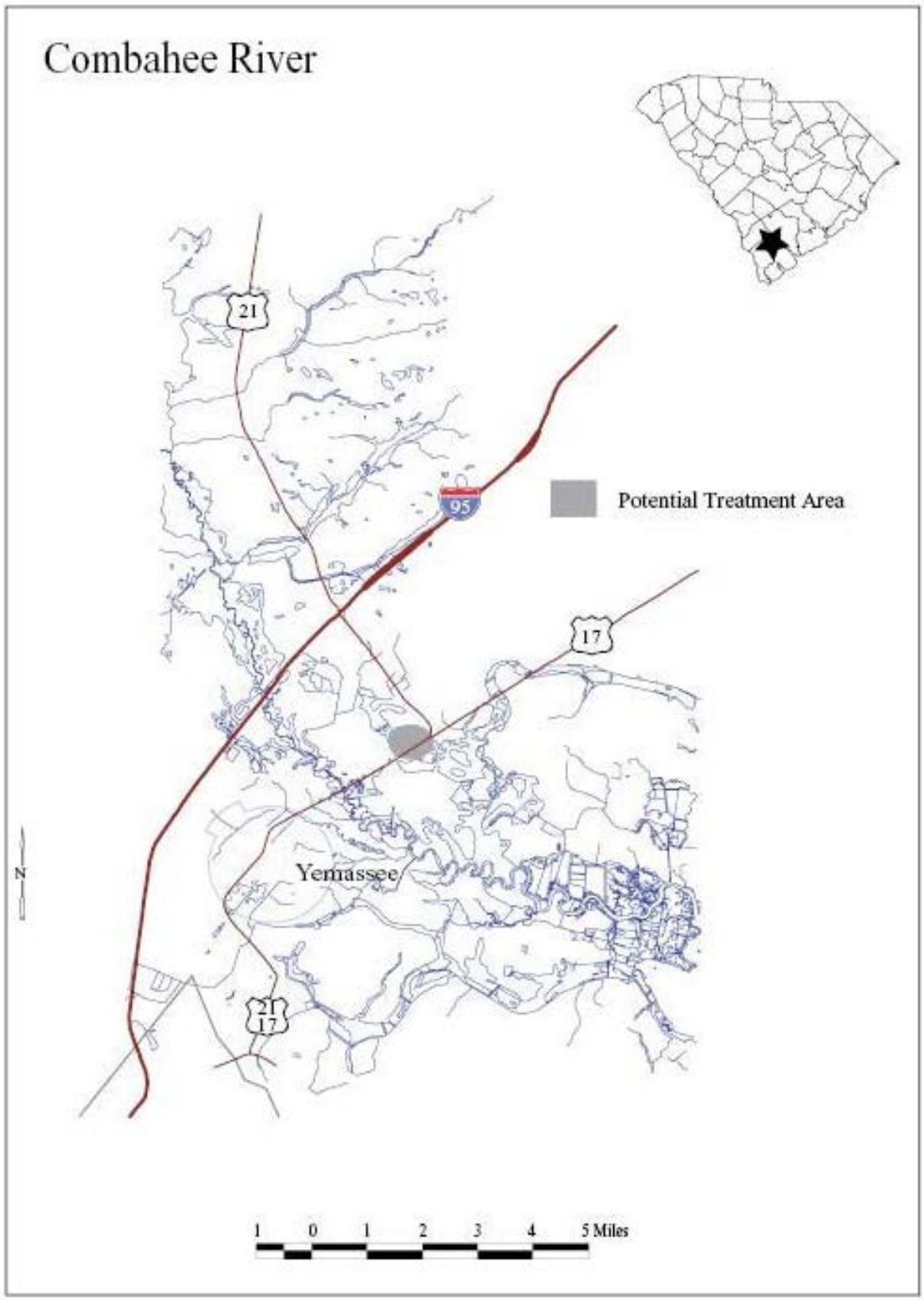
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Combahee River
21
95
17
21
17
Potential Treatment Area
Yemassee
N
1 0 1 2 3 4 5 Miles

8. Combahee River (Borrow pit) (Colleton County)

Problem plant species

Alligatorweed, Parrot feather, Frog's bit

Management objective

Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.

Selected control method

Problem Species	Control Agent
Alligatorweed	Renovate 3, Habitat, Clearcast, Glyphosate
Frog's bit, Parrot feather	Reward, Galleon SC

Area to which control is to be applied

4 acres of problematic plants to be treated 2 times during the growing season.

Rate of control agent to be applied

Reward - 0.500 gallon per acre.

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 6 pints per acre.

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$710

Potential sources of funding

Colleton County 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

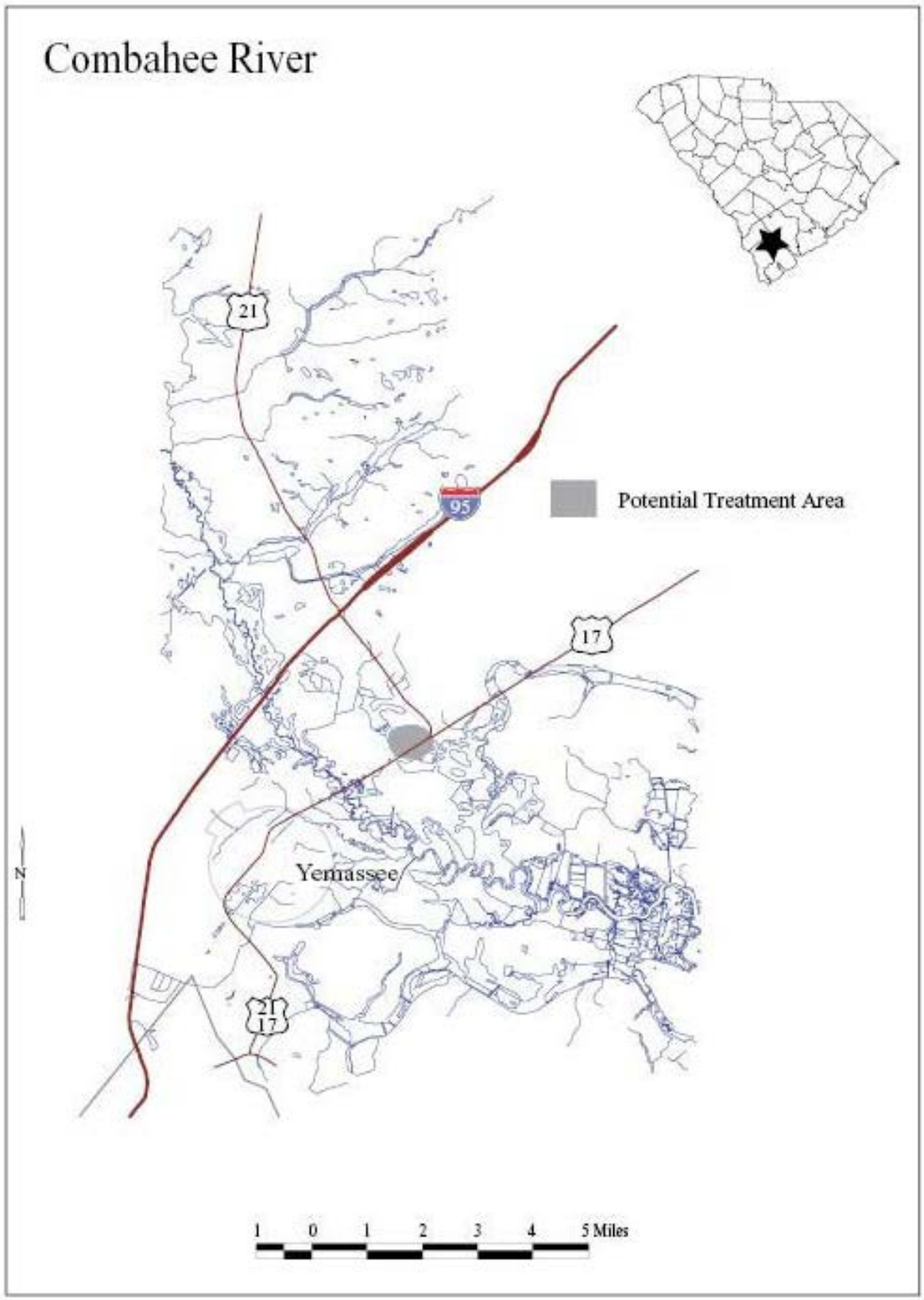
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Continue to coordinate treatment areas with local conservation groups.


Combahee River
21
95
17
21
17
Potential Treatment Area
Yemassee
N
1 0 1 2 3 4 5 Miles

9. Cooper River (Berkeley County)

Problem plant species

Hydrilla, Water hyacinth, Water primrose

Management objectives

Reduce water hyacinth populations to the greatest extent possible in the Main River and public ricefields.

Reduce water primrose growth along boat channels to maintain navigation.

Open limited boat trails in hydrilla infested ricefields to enhance public access to the river and selected ricefields.

Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Glyphosate, Galleon SC
Water primrose	Renovate 3, Reward, Habitat, Clearcast, Glyphosate
Hydrilla	Chelated copper*

* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

Area to which control is to be applied

Renovate 3, Reward, Habitat, Clearcast, Glyphosate, Galleon SC - 300 acres of water hyacinth and water primrose throughout river system and in narrow boat channels in French Quarter Creek, Rice Hope Plantation ricefield, and Berkeley Country Club ricefield.

Chelated copper - 48 acres (16 acres treated 3 times yearly, spring and fall) to open boat trails in Pimlico, Berkeley Yacht Club and Rice Hope Plantation ricefields and French Quarter Creek canal.

Rate of control agents to be applied

Habitat - 2 to 4 pints per acre.

Reward - 2 quarts per acre.

Renovate 3 - up to 4 quarts per acre

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

Chelated copper - up to 1 ppm (about 16 gallons per acre).

Galleon SC - Floating species – 2 to 6 fl oz/acre as foliar application.

Method of application of control agent

Renovate 3, Reward, Habitat, Galleon SC - spray on surface of foliage with appropriate surfactant.

Chelated copper - subsurface injection from airboat.

Timing and sequence of control application

All agents to be applied when plants are actively growing. Chelated copper treatment of boat trails to be conducted as close to low tide as possible to minimize water movement.

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$28,000

Potential sources of funding

Berkeley County 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

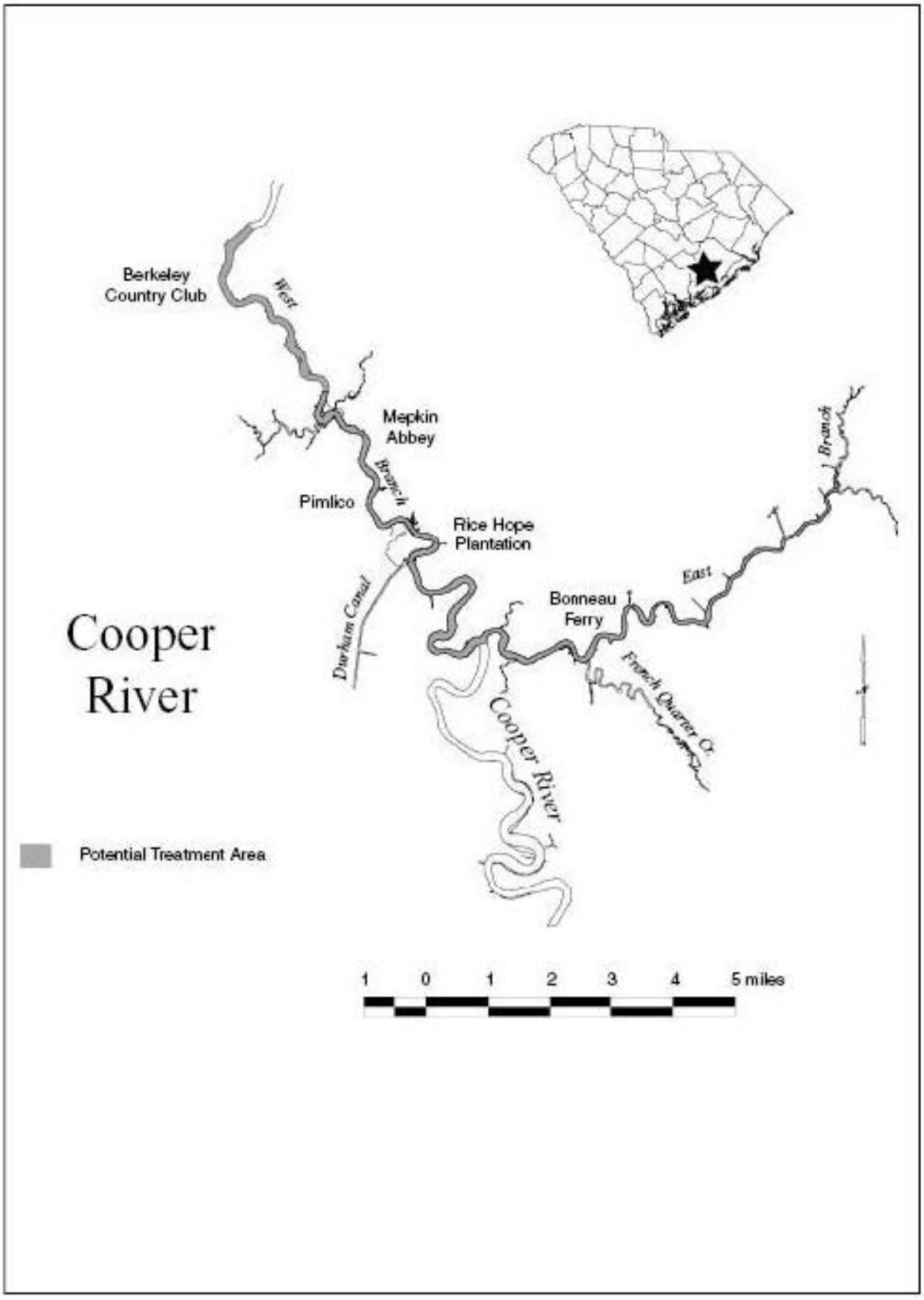
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Long term management must include consideration of water hyacinth control in many privately owned ricefields to which the public does not have boat access. Water hyacinth from these ricefields can reinfest public areas.


Berkeley
Country Club
West
Branch
Mepkin
Abbey
Pimlico
Rice Hope
Plantation
Durham Canal
Cooper
River
Bonneau
Ferry
East
Branch
French Quarter Cr.
Cooper River
Potential Treatment Area
1 0 1 2 3 4 5 miles

10. Donnelley WMA/Bear Island WMA/ACE Basin (Colleton County)

Problem plant species

Frog's bit, Cattails, Cutgrass, Phragmites, Swamp loosestrife

Management objective

Reduce problem plant populations to enhance waterfowl habitat, public access and use.

Selected control method

Problem Species	Control Agent
Frog's bit	Renovate 3, Galleon SC
Phragmites, Cattails	Habitat, Clearcast, Glyphosate
Cutgrass, Swamp loosestrife	Habitat, Clearcast, Glyphosate

Area to which control is to be applied

40 acres of Frog's bit, Phragmites, Cattails, Cutgrass, and Swamp loosestrife throughout the area.

Rate of control agent to be applied

Renovate 3 - 0.500 to 0.750 gallons per acre

Habitat - 2 to 3 pints per acre.

Clearcast - 1 to 4 pints per acre.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - Floating species – 2 to 12 fl oz/acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

Other control application specifications

Application to be conducted by airboat and helicopter.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$2,858

Potential sources of funding

Donnelley WMA/USF&W 50%

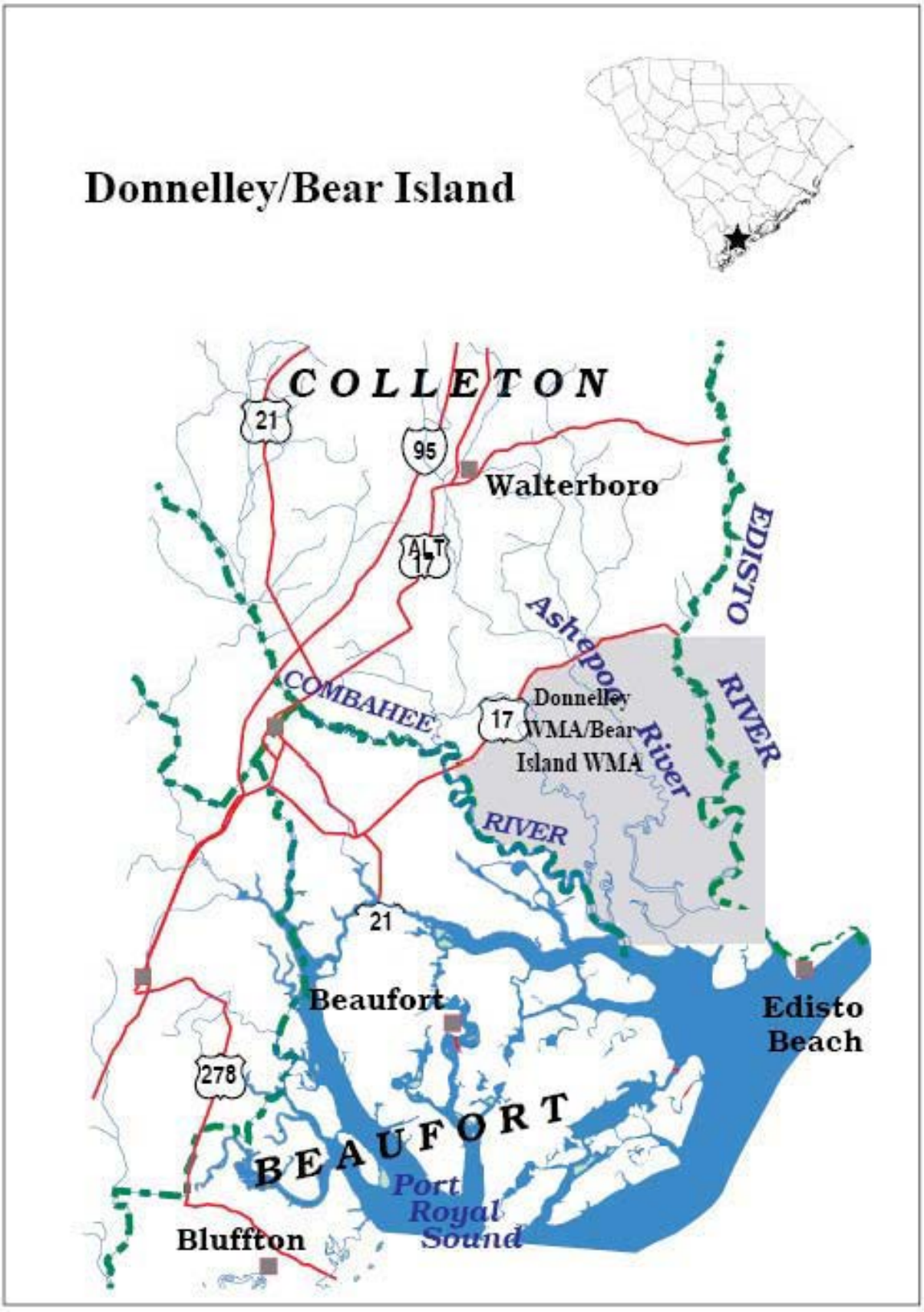
S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.


Donnelley/Bear Island
COLLETON
21
95
Walterboro
ALT 17
EDISTO
Ashepoo
COMBAHEE
17
Donnelley WMA/Bear Island WMA
River
RIVER
RIVER
21
Beaufort
Edisto Beach
278
BEAUFORT
Port Royal Sound
Bluffton

11. Dungannon Plantation Heritage Preserve (Charleston County)

Problem plant species

Frog's bit, Cattails, Bur Marigold, Cutgrass, Water Primrose, Swamp loosestrife

Management objective

Reduce problem plant populations to enhance Wood stork nesting habitat, public access and use.

Selected control method

Problem Species	Control Agent
Frog's bit, Water primrose, Bur marigold	Renovate 3, Habitat, Clearcast, Glyphosate, Galleon SC
Cattails	Habitat, Clearcast, Glyphosate
Cutgrass, Swamp loosestrife	Habitat, Clearcast, Glyphosate

Area to which control is to be applied

14 acres of Frog's bit, Water primroses, and Bur marigold

14 acres of Cattails, Cutgrass, and Swamp loosestrife throughout the area.

Rate of control agent to be applied

Renovate 3 - 0.500 to 0.750 gallons per acre.
Habitat - 2 to 3 pints per acre.
Clearcast - 1 to 4 pints per acre.
Glyphosate - up to 6 pints per acre.
Galleon SC - Floating species – 2 to 12 fl oz/acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

Other control application specifications

Application to be conducted by airboat and Jon-boat.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$2,000

Potential sources of funding

Donnelley WMA/USF&W 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

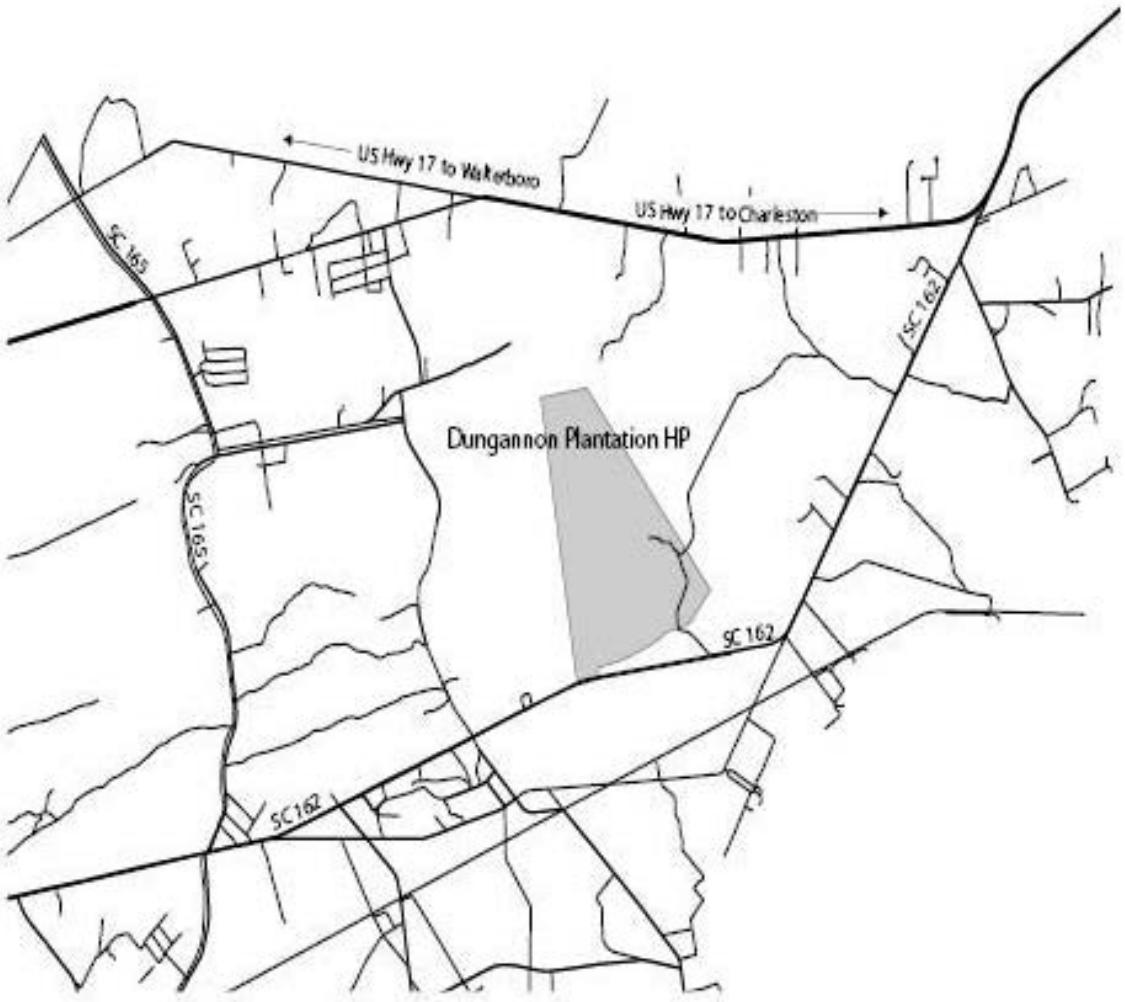
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Enhance aquatic plant communities to benefit waterfowl and to increase nesting activities of Wood storks and other waterfowl.

Dungannon Plantation HP



12. Goose Creek Reservoir (Berkeley County)

Problem plant species

Hygrophila, Water hyacinth, Water primrose, Water lettuce, Hydrilla, Watermilfoil, Fanwort, Salvinia minima, Duckweed

Management objective

Reduce water hyacinth and water lettuce populations to the greatest extent possible throughout the lake.

Reduce water primrose, water lettuce and water hyacinth in the upper portion of the lake to enhance water flow and public access.

Reduce hydrilla growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to public use and access.

Reduce duckweed growth throughout populated portions of the lake to minimize adverse impacts to public use and access.

Reduce filamentous algae growth throughout populated portions of the lake to minimize adverse impacts to public use and access.

Maintain diverse aquatic plant community through selective application of control methods.

Selected control method

Problem Species	Control Agent
Water primrose, Hygrophila	Renovate 3, Habitat, Clearcast, Glyphosate
Water hyacinth, Water lettuce	Renovate 3, Reward, Galleon SC
Watermilfoil, fanwort	Reward, Hardball, Clearcast
Hydrilla, Hygrophila	Aquathol K, chelated copper, triploid grass carp
Duckweed	Sonar, Reward, Galleon SC
Filamentous Algae	Captain

Area to which control is to be applied

Renovate 3, Habitat, Clearcast, Glyphosate- 100 acres water primrose in upper reservoir and boat ramp.

Reward - 50 acres of water hyacinth and water lettuce throughout reservoir.

Renovate 3, Reward, Galleon SC - 100 acres of water hyacinth and water lettuce throughout the reservoir.

Reward, Hardball, Galleon SC - 20 acres of submersed growth throughout the reservoir.

Renovate 3, Habitat, Clearcast, Glyphosate, Aquathol – up to 30 acres of Hygrophila throughout the reservoir.

Release triploid grass carp in areas of the lake with greatest hydrilla growth. Grass carp will be released in selected areas, such as boat ramps and park sites, around the reservoir to achieve as even a distribution as practicable.

Sonar, Reward, Galleon SC – 50 acres of duckweed near populated areas of the reservoir.

Captain – 50 acres of filamentous algae near populated areas of the reservoir.

Rate of control agents to be applied

Reward - 0.500 gallon per acre.
Renovate 3 - 0.500 to 0.750 gallons per acre.
Habitat - up to 4 pints per acre.
Clearcast - 1 to 4 pints per acre.
Glyphosate - up to 6 pints per acre.
Hardball - up to 5 gallons per acre.

Galleon SC - Submersed 0.174 fl oz/acre foot to achieve minimum effective concentration of 25 to 75 ppb Floating species – 2 to 6 fl oz/acre as foliar application.

*Triploid Grass Carp - 825 fish in the entire reservoir.
*Based on a 32%(825) mortality to maintain existing population.

Method of application of control agents

Renovate 3, Habitat, Glyphosate, Reward, Galleon SC - spray on surface of foliage with appropriate surfactant.

Reward, Hardball, Galleon SC - subsurface injection from airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Timing and sequence of control application

All agents to be applied when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2011 (March-May). RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time. Coordinate all control operations with Charleston Commissioners of Public Works and Goose Creek Reservoir Watershed Task Force.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Goose Creek Reservoir will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

Hydrilla is slowly increasing in acreage along with other submerged species. Hydrilla populations will be carefully monitored and in the event that significant regrowth occurs

during the year the Aquatic Plant Management Council may consider the need for additional grass carp or treat with herbicides to give short-term control as needed.

Entity to apply control agents

Herbicides - Commercial Applicator

Triploid Grass Carp - S.C. Public Service Authority and/or a commercial supplier with supervision by the SCDNR.

Estimated cost of control operations

$34,943

Potential sources of funding

Charleston Commissioner of Public Works 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

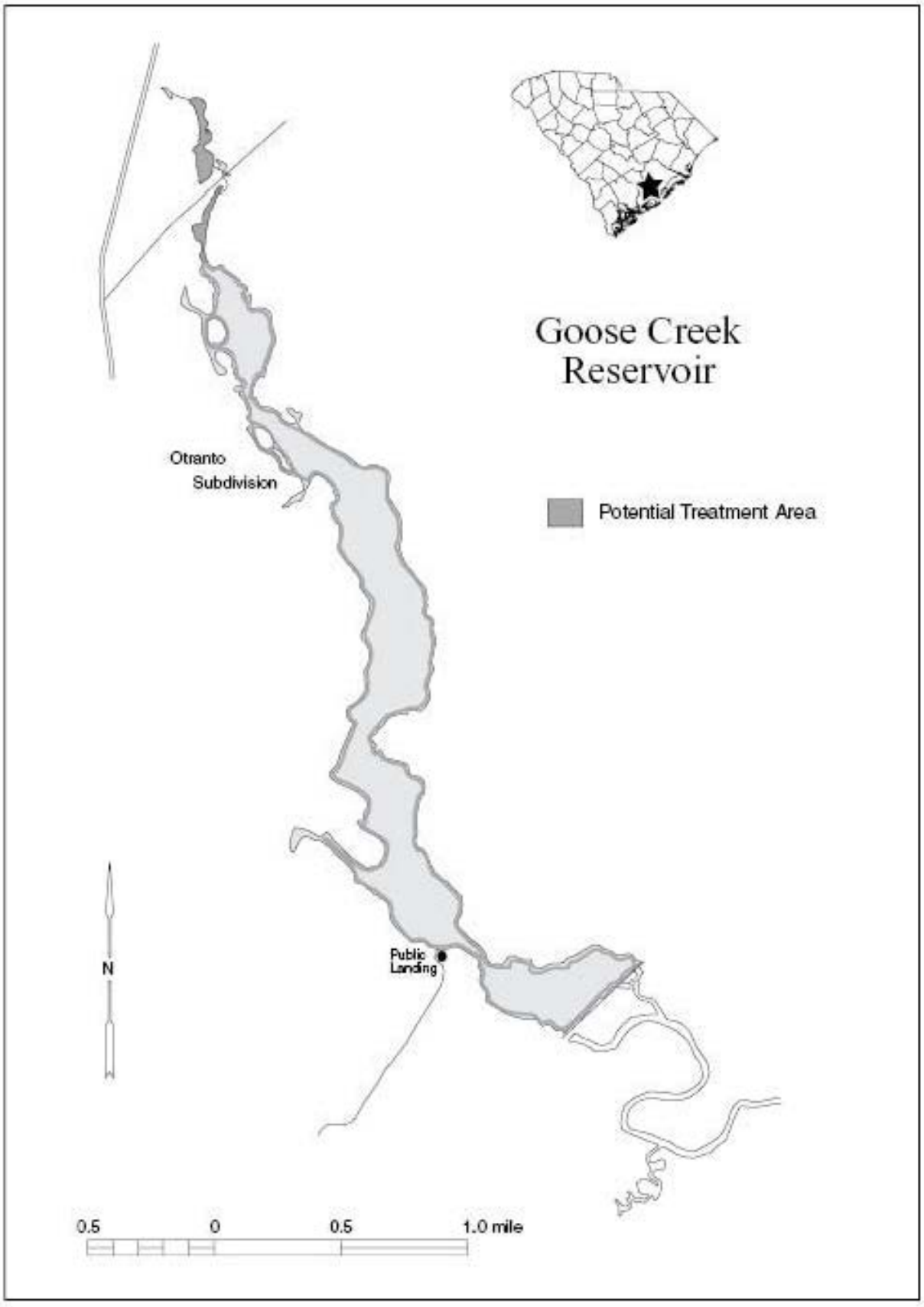
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species


Goose Creek
Reservoir
Otranto
Subdivision
Potential Treatment Area
Public
Landing
N
0.5
0
0.5
1.0 mile

13. Lake Cunningham (Greenville County)

Problem plant species

Brazilian elodea, Fragrant water-lily, Water primrose, Spatterdock

Management objective

Reduce nuisance plant populations to the greatest extent possible throughout lake to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

Selected control method

Problem Species	Control Agent
Brazilian elodea	Chelated copper, triploid grass carp
Water primrose,	Renovate 3, Habitat, Clearcast,
Fragrant waterlily, spatterdock	Renovate 3, Habitat, Clearcast,

Area to which control is to be applied

10 acres of problematic plants throughout Lake Cunningham.

Rate of control agent to be applied

Renovate 3 - 0.500 to 0.750 gallons per acre.
Habitat - 2 to 3 pints per acre.
Clearcast - 1 to 4 pints per acre.
Chelated copper – up to 1 ppm.
Triploid grass carp – Stock to maintain 1 fish per 8 surface acre density when population levels dictate.

Method of application of control agent

Herbicides spray on surface of foliage with appropriate surfactant from boat or subsurface injection from airboat.
Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest Brazilian elodea growth.

Timing and sequence of control application

Herbicide - Apply when plants are actively growing.
Triploid grass carp to be released as soon as possible in the spring of 2011 (March-May).
RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Lake Cunningham will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake and additional incremental stockings may be necessary based on the possibility of escape via the outflow at the dam

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$2,500

Potential sources of funding

Greer CPW 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

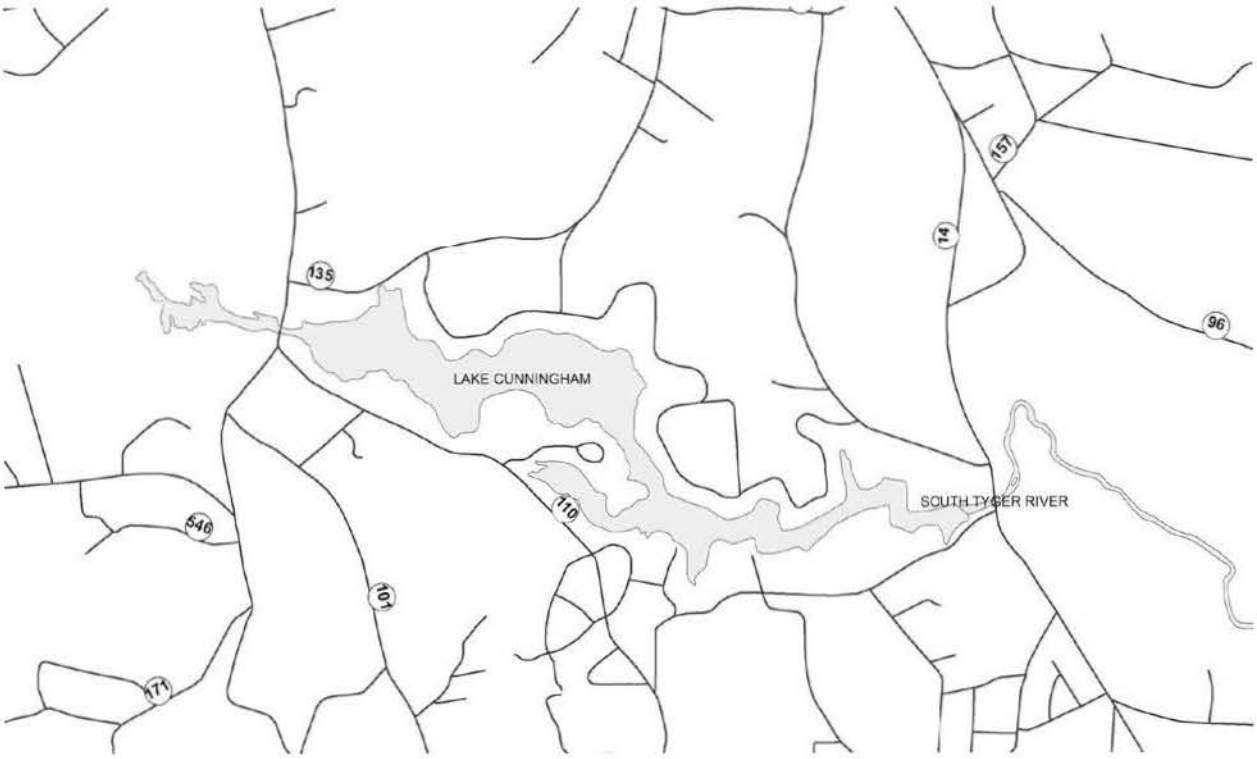
b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) A long-term integrated management strategy has been implemented to control Brazilian elodea. Triploid grass carp have been stocked to control Brazilian elodea growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual maintenance stocking of grass carp to maintain the population at a level that is sufficient to maintain control of Brazilian elodea but to minimize impacts on desirable native plant populations.

d) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

e) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.

Lake Cunningham



14. Lake Darpo (Darlington County)

Problem plant species

Water lily, Milfoil

Management objectives

Reduce problem plant populations to enhance waterfowl habitat, public access and use.

Selected control method

Problem Species	Control Agent
Water lily, milfoil	Hardball, Renovate Max G

Area to which control is to be applied

Hardball, Renovate Max G - 10 acres of Milfoil infestation.

Rate of control agents to be applied

Hardball - up to 5 gallons per acre.
Clearcast - up to 0.500 gallons per acre per acre.
Renovate Max G – 200 lbs per acre.

Method of application of control agents

Hardball - subsurface injection from airboat. Clearcast application to exposed seed heads above the waterline. Granular herbicides spread evenly using appropriate rate. Application by airboat with adjuvant two (2) times per year.

Timing and sequence of control application

Agent to be applied when plants are actively growing.

Other control application specifications

Treatment of control area is to be conducted in a manner that will not significantly degrade water quality.

Milfoil may require multiple treatments.

Entity to apply control system

Commercial applicator

Estimated cost of control operations

$3,558

Potential sources of funding

Darlington County 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

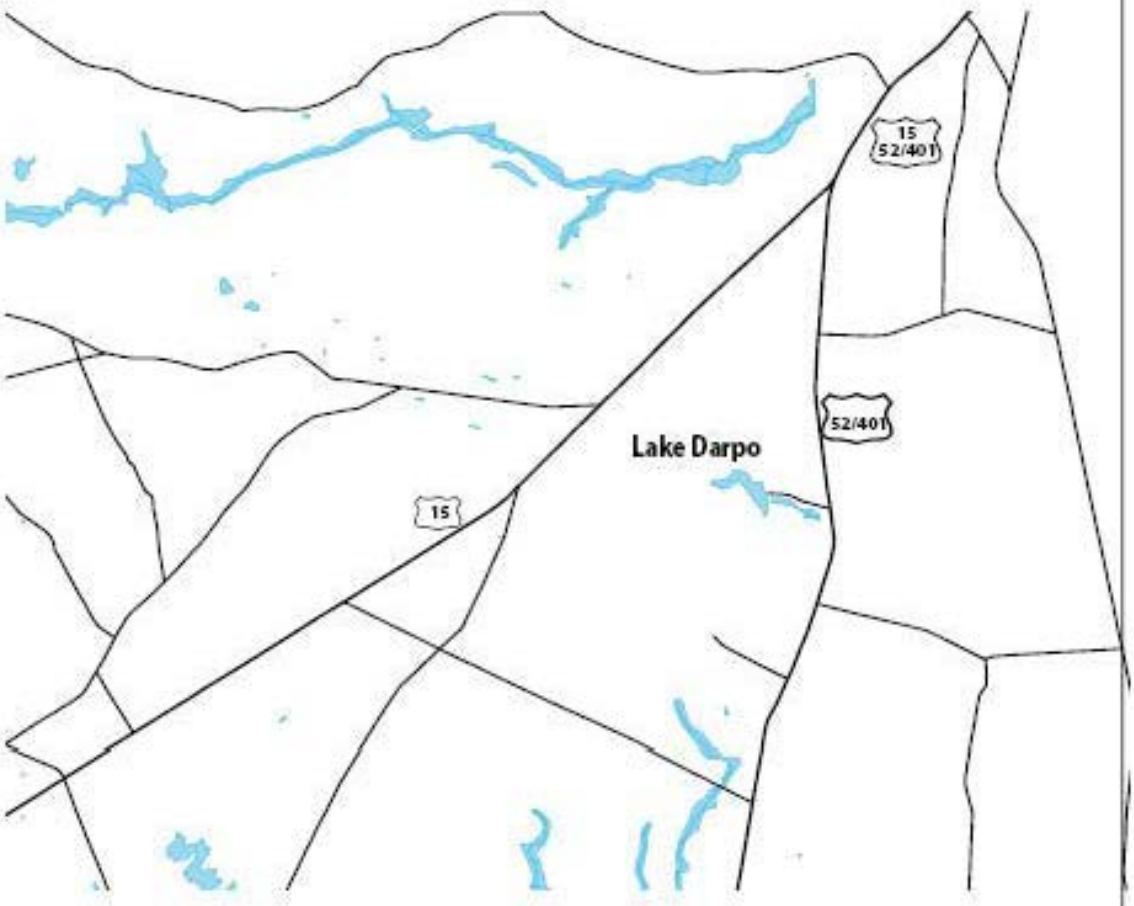
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Lake Darpo



15. Lake Greenwood (Greenwood and Laurens County)

Problem plant species

Slender naiad, Hydrilla, Water primrose

Management objectives

Reduce slender naiad and water primrose in developed shoreline areas and areas of high public access and use.

Manage hydrilla growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to agricultural irrigation withdrawals, and public use and access.

Selected control method

Problem Species	Control Agent
Slender naiad, Hydrilla	Aquathol K, Sonar, Triploid Grass Carp, chelated copper*
Water primrose	Renovate 3, Glyphosate, Habitat, Clearcast

Area to which control is to be applied

Slender naiad – Approximately 5 acres in priority areas such as public and commercial access sites and residential shoreline areas throughout the lake.

Water primrose – Approximately 10 acres in priority areas such as public and commercial access sites and residential shoreline areas throughout the lake.

Hydrilla - Approximately <25 acres in public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the lake and use herbicide applications to provide immediate short-term control of localized growth in approximately 5 acres of hydrilla infestation in upper Rabon Creek arm, 5 acres in the Reedy River Arm, 5 acres around Greenwood State Park, 5 acres in Lick Creek Branch, and 5 acres in the lower half of the lake.

Rate of control agents to be applied

Aquathol K - 0.500 to 4 ppm (about 3 to 8 gallons per acre depending on depth)

Habitat – 0.250 – 0.750 gallons per acre

Clearcast - -up to 5% spot spray

Sonar - 0.075 to 0.250 ppm

Chelated Copper- up to 1 ppm

Sonar Q, Sonar PR - up to .40 ppm (approx 10 pounds/acre)

Triploid Grass Carp – Stock to maintain 1 to 8 surface acres density when population dictates.

Method of application of control agents

Aquathol K, Sonar, chelated copper* - Subsurface application by airboat with adjuvant.

Renovate 3, Glyphosate, Habitat, Clearcast - spray on surface of foliage with appropriate surfactant.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Timing and sequence of control application

Agent to be applied to slender naiad when plants are actively growing.

Agent to be applied to hydrilla when plants are actively growing but prior to tuber production.

Triploid grass carp to be released as soon as possible in the spring of 2011 (March-May). RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Treatment of control area is to be conducted in a manner that will not significantly degrade water quality. Survey and final determination of treatment areas to be conducted in conjunction with the South Carolina Department of Natural Resources district fisheries biologist. In general, treatment will be limited to developed shoreline areas, public access sites, and areas of high public use.

Hydrilla may require multiple treatments.

Entity to apply control system

Commercial applicator

Estimated cost of control operations

$20,000

Potential sources of funding

Greenwood County 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

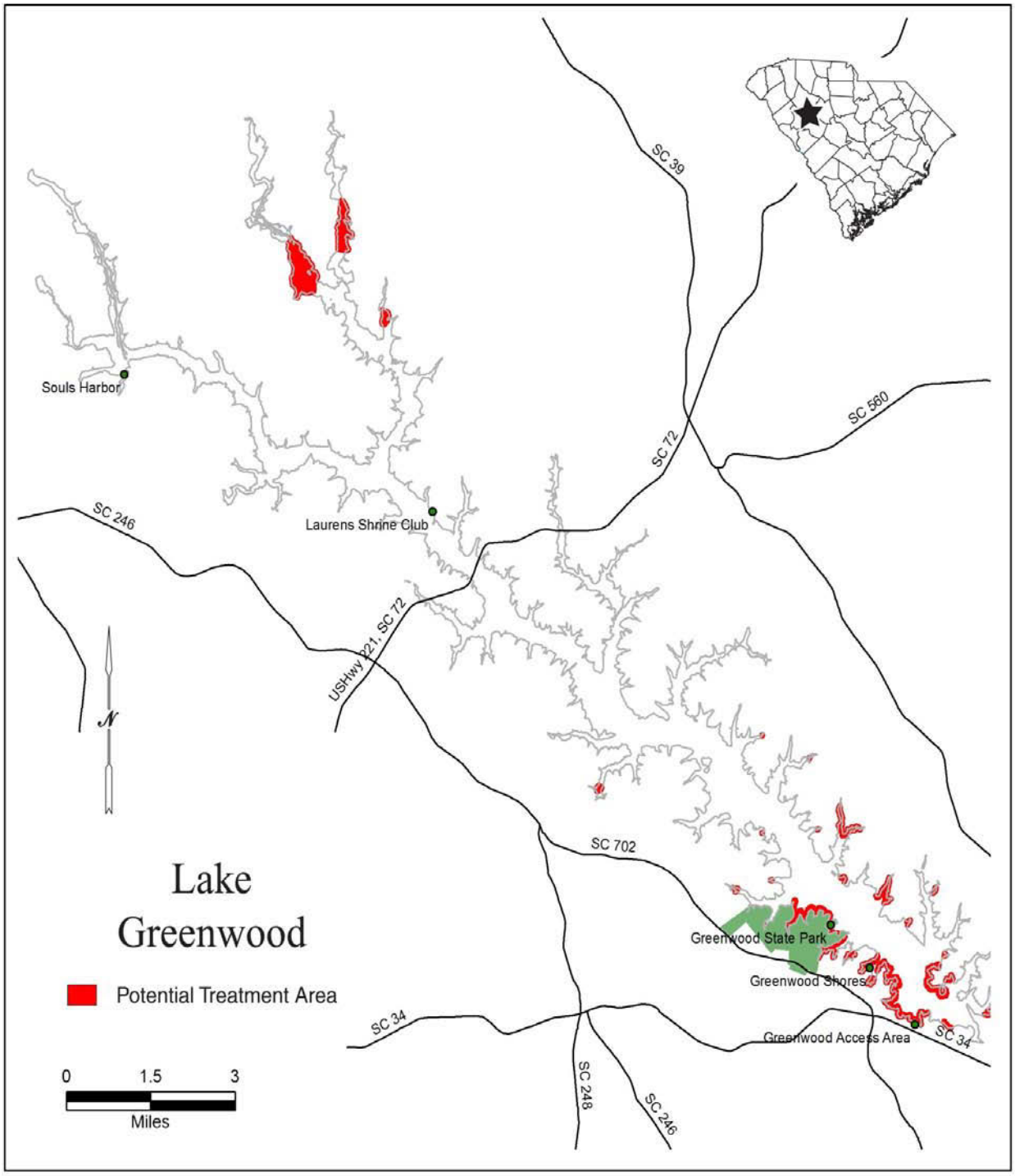
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Souls Harbor
Laurens Shrine Club
SC 39
SC 72
SC 560
SC 246
USHwy 221, SC 72
N
Lake
Greenwood
Potential Treatment Area
0
1.5
3
Miles
SC 702
Greenwood State Park
Greenwood Shores
Greenwood Access Area
SC 34
SC 34
SC 248
SC 246

16. Lake Keowee (Pickens and Oconee County)

Problem plant species

Hydrilla

Management objectives

Keep hydrilla growth suppressed to minimize its spread within the lake, help prevent its spread to adjacent public waters and minimize adverse impacts to water use activities.

Selected control method

Chelated copper *

Fall/winter water level drawdown

* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

Area to which control is to be applied

Chelated copper - 10 acres

Drawdown - entire lake

Rate of control agent to be applied

Chelated copper - up to 1 ppm (about 16 gallons per acre)

Drawdown - to the greatest extent possible within project limits.

Method of application of control agent

Chelated copper - subsurface injection by airboat with adjuvant.

Drawdown - draw lake down.

Timing and sequence of control application

Herbicide application - when plants are actively growing.

Drawdown - Drawdown Lake from October through February.

Other control application specifications

Herbicide application - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.

Entity to apply control system

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

Estimated cost of control operations

Herbicide application - $0.00 (Hydrilla has not been observed in several years on Lake Keowee, therefore no applications are needed at this time.)

Drawdown - Undetermined

Potential sources of funding

Duke Power Company 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

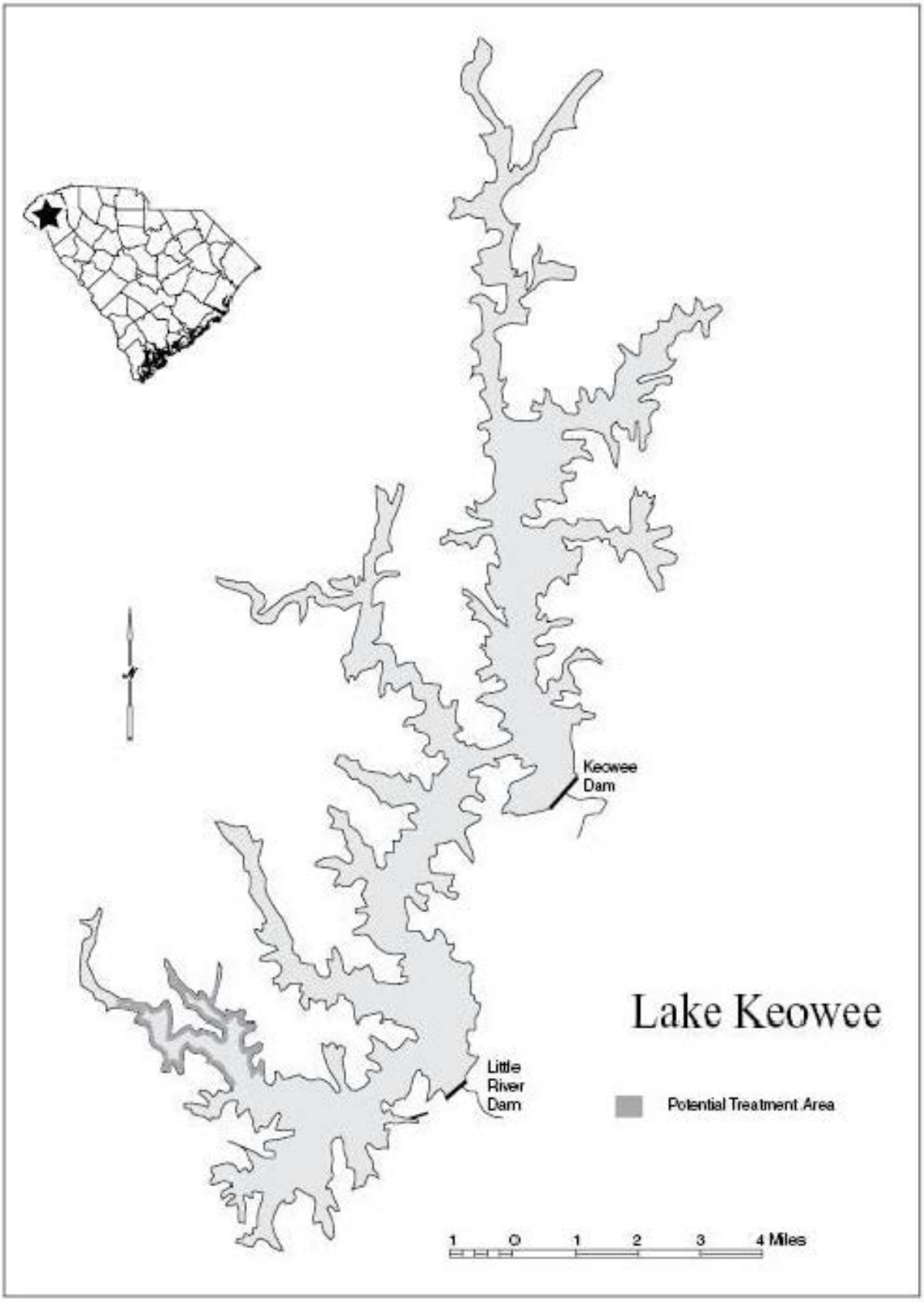
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Keowee
Dam
Lake Keowee
Little
River
Dam
Potential Treatment Area
1 0 1 2 3 4 Miles

17. Lake Murray
(Lexington, Newberry, Richland and Saluda Counties)

Problem plant species

Hydrilla, Illinois pondweed, Water Primrose

Management objectives

Maintain reduced hydrilla and Illinois pondweed growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to drinking water withdrawals and public use and access.

Monitor water primrose growth and consider control options if impacts are greater than anticipated.

Maintain diverse aquatic plant community through selective application of control methods and introduction of desirable native plant species.

Selected control method

Triploid grass carp stocked in 2003 substantially reduced hydrilla coverage in Lake Murray during 2003-2010 Consequently, no additional grass carp stockings are planned for these areas in 2011 However, hydrilla populations and potential regrowth will be carefully monitored and in the event that survey results and regrowth warrant, the Aquatic Plant Management Council may reconsider the need for additional grass carp.

Mechanical harvester – short-term control in selected areas to provide public access and clear areas around municipal water intakes.

Aquatic herbicides - short-term control in selected areas to provide public access and clear areas around municipal water intakes.

Problem Species	Control Agents
Hydrilla	Chelated copper (Nautique)
Water primrose	Renovate 3, Habitat, Clearcast

Area to which control is to be applied

If needed, release triploid grass carp in areas of the lake with greatest hydrilla growth.

Use mechanical harvesters or aquatic herbicides to provide immediate short-term control at high priority public access points, such as boat ramps and park sites, and municipal water intakes (75 acres of water primrose).

Rate of control agent to be applied

If hydrilla acreage in 2011 warrants, additional grass carp may be stocked to maintain a density of 1 per surface acre following Council approval.
Harvest acreage as needed to provide public use, access and clear areas around municipal water intakes.
Apply aquatic herbicides to provide immediate short-term control at high priority public

access points and municipal water intakes.
Chelated copper - up to 1 ppm
Renovate 3 - 0.500 to 0.750 gallons per acre.
Habitat - 2 to 4 pints per acre.
Clearcast - 1 to 4 pints per acre.

Method of application of control agent

Triploid grass carp - See section 3 above.

Use mechanical harvester as designed.

All agents to be applied when plants are actively growing.

Timing and sequence of control application

If hydrilla acreage in 2011 warrants, additional grass carp may be stocked following Council approval.

Harvest aquatic growth as it becomes problematic; multiple applications are likely.

Apply herbicides to aquatic vegetation as it becomes problematic.

Other control application specifications

If needed, all sterile grass carp will be a minimum of 12 inches in length. All sterile grass carp shipments for Lake Murray will be examined by the SCDNR for sterility, size, and condition at the Campbell Fish Hatchery in Columbia prior to stocking in the lake.

Harvested vegetation must be removed from the lake and deposited on high ground. The harvesting process must minimize adverse impacts to fish.

Control by Residential/Commercial Interests:

This plan is designed to provide relief from noxious aquatic vegetation for the public at large. Private entities such as lake-front residents and commercial interests may have site specific concerns not addressed immediately by the use of grass carp or mechanical harvesters at public access areas. Residential and commercial interests may remove nuisance aquatic vegetation manually or by use of mechanical harvesting devices. Of the three major control methods the following conditions apply.

1) Mechanical harvesters – Commercial aquatic plant harvesting services may be hired to remove hydrilla and Illinois pondweed from areas adjacent to residential and commercial property after notification of SCE&G. Harvesting precautions as stated in item above must be adhered to.

2) Aquatic herbicides – SCE&G opposes regular or general application of herbicides in Lake Murray, therefore, aquatic herbicides may not be applied in the lake by lake front property owners.

3) Sterile grass carp - A sufficient number of grass carp are being stocked by SCDNR to control nuisance aquatic vegetation. Stocking additional grass carp in Lake Murray without written consent by the SCDNR is prohibited.

Entity to apply control agent

Triploid grass carp - Commercial supplier with supervision by the SCDNR.

Mechanical harvester – Commercial harvester under supervision of SCE&G at park sites and public boat ramps; private marina operators to contract for application at commercial boat ramps.

Aquatic herbicides - Commercial applicator under supervision by the SCDNR.

Estimated cost of control operations

Triploid grass carp - None anticipated

Mechanical harvester - $500-1000/acre

Aquatic herbicides - $0

Potential sources of funding

Triploid grass carp if needed.

S.C. Electric and Gas Company, Lexington and Richland Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

Mechanical harvester, S.C. Electric and Gas Company, Commercial marina operators, and residential property owners.

Aquatic herbicides

S.C. Electric and Gas Company, Lexington and Richland Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

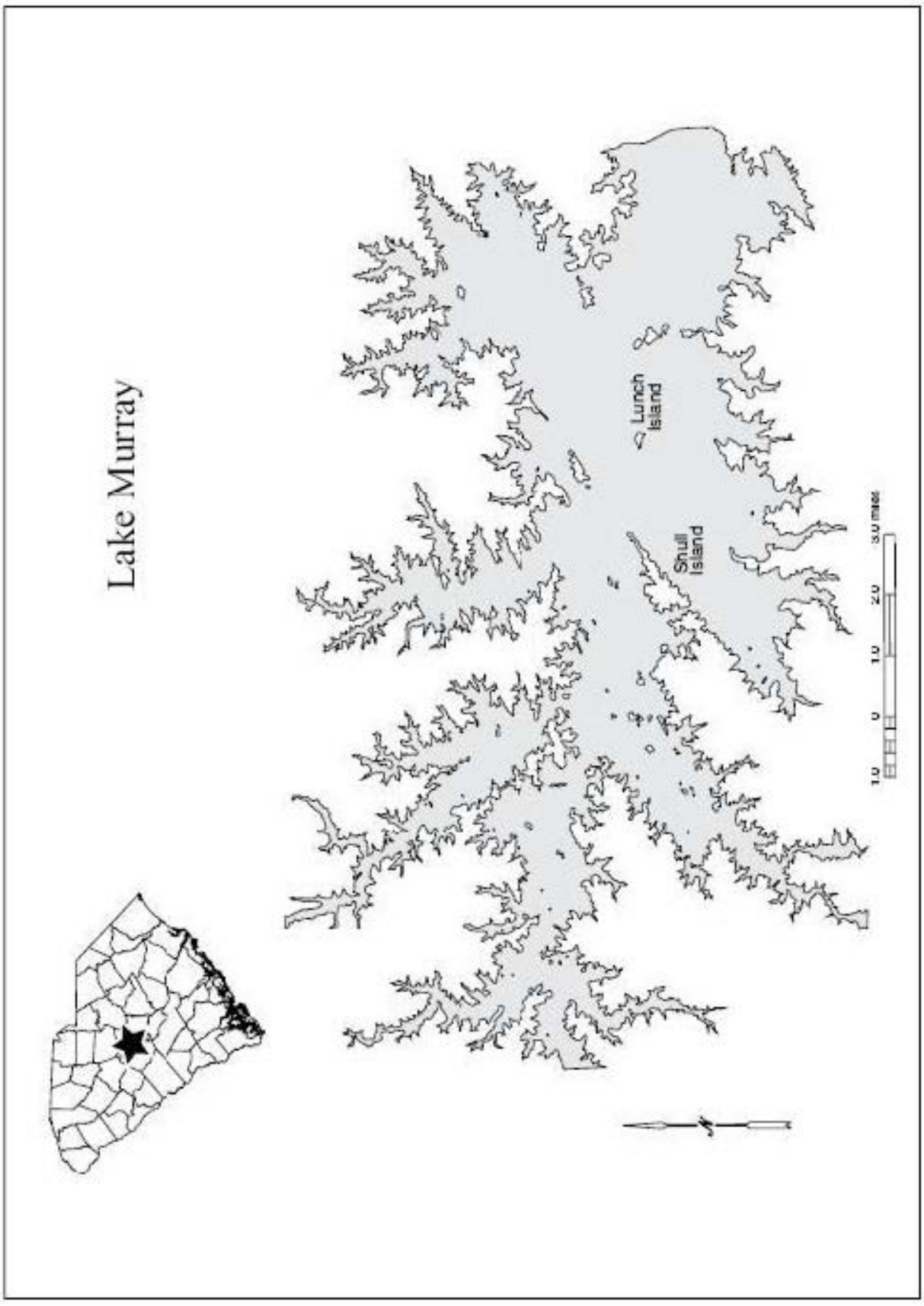
c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Improve public awareness and understanding of aquatic plant management activities through the maintenance of the Lake Murray Aquatic Plant Management web site. The web

site includes up-to-date information on annual management plans, dates and locations of current and historical control operations, locations of habitat enhancement activities, and other pertinent information.

e) Periodically revise the management strategy and specific control sites as new environmental data and control agents and techniques become available and public use patterns change.

f) Water primrose - Water primrose, a shoreline plant, became problematic in the upper portion of the lake last year. The two-year drawdown exposed a lot of unvegetated shoreline where water primrose quickly spread and re-established at the 345-348 foot contour level. While this plant can be invasive and cause localized problems, it has been in the lake for decades and is typically not a threat to general public access and use of the waterway. Based on past experience, it is expected that most of the plants that are rooted in deep water will not survive after the lake level returns to full pool. Therefore, there are no plans to control its growth this year. However, the SCDNR and SCE&G will monitor water primrose growth and consider control options if impacts are greater than anticipated.


Lake Murray
Lunch Island
Shull Island
3.0 miles

18. Lake Wateree (Fairfield, Kershaw and Lancaster Counties)

Problem plant species

Hydrilla

Management objective

Keep hydrilla growth suppressed to prevent its spread within the lake, help prevent its spread to adjacent public water, and minimize adverse impacts to water use activities.

Selected control method

Aquathol K

Fall/winter water level drawdown

Area to which control is to be applied

Aquathol K - At least 2 acres in cove near Lakeside Marina. (Hydrilla has not been observed in several years on Lake Wateree, therefore no applications are needed at this time.)

Drawdown - Entire Lake

Rate of control agent to be applied

Aquathol K - 4 ppm (about 8 gallons per acre depending on depth)

Drawdown - To the greatest extent possible within project limits.

Method of application of control agent

Aquathol K - Subsurface injection from airboat with adjuvant.

Drawdown - Draw lake down

Timing and sequence of control application

Aquathol K - 2 acres treated twice in June and again in fall of year.

Drawdown - Drawdown lake from October through February.

Other control application specifications

Aquathol K - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.

Entity to apply control agent

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

Estimated cost of control operations

Herbicide application - $0.00 (Hydrilla has not been observed in several years on Lake Wateree, therefore no applications are needed at this time.)

Drawdown - Undetermined

Potential sources of funding

Duke Power Company 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

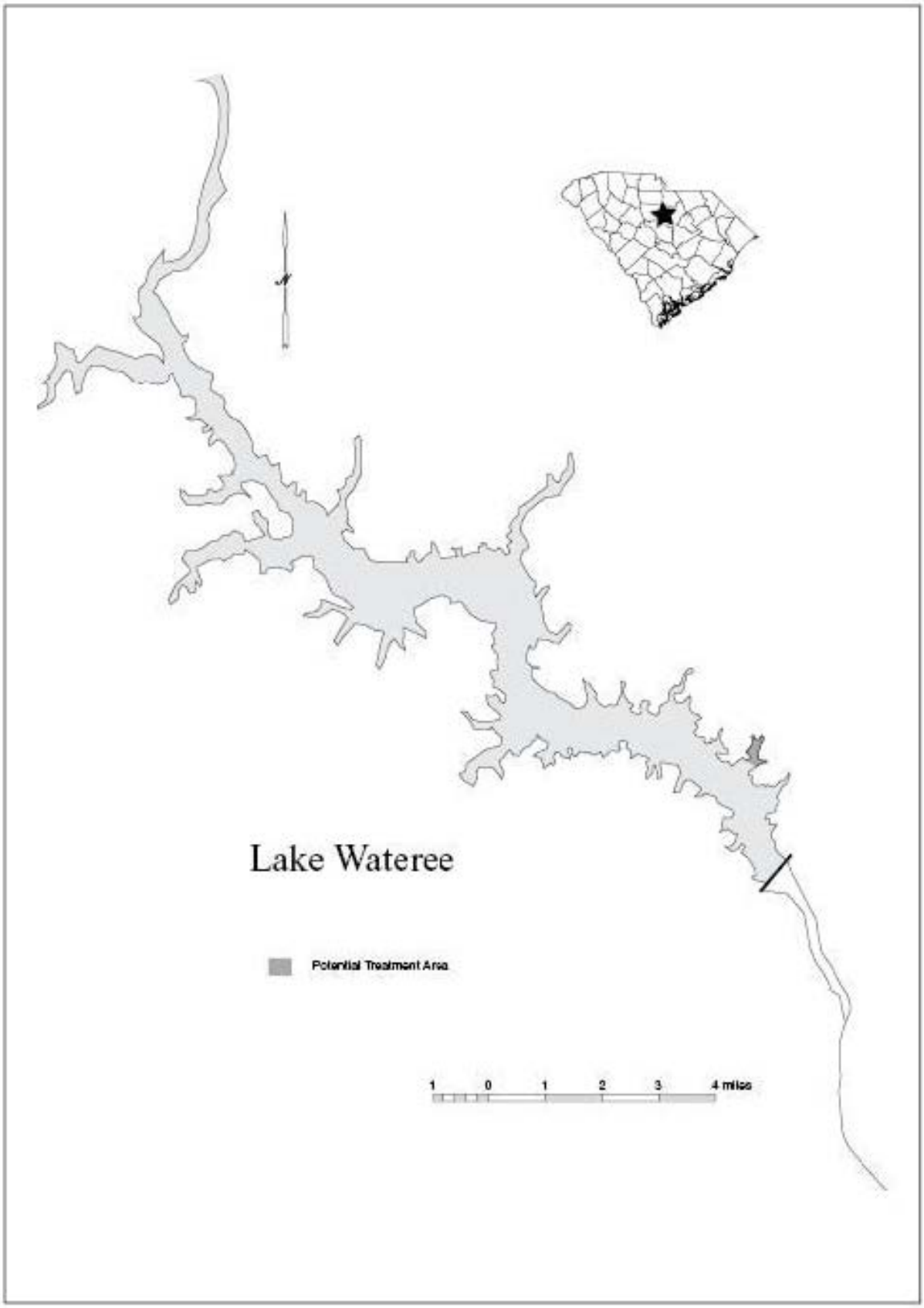
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Lake Wateree
Potential Treatment Area
1 0 1 2 3 4 miles

19. Little Pee Dee River (Marion and Horry Counties)

Problem plant species

Alligatorweed, Water hyacinth

Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and alligatorweed populations to the greatest extent possible

Selected control method

Problem Species	Control Agent
Water hyacinth	Renovate 3, Reward, Clearcast, Glyphosate, Galleon SC
Alligatorweed	Renovate 3, Reward, Habitat, Clearcast, Glyphosate
Biological Control -	Alligatorweed flea beetles, *Agasicles hygrophila*

Area to which control is to be applied

30 acres of alligatorweed and water hyacinth throughout river

Rate of control agent to be applied

Habitat - 0.250 to 0.750 gallons per acre.
Reward - 0.500 gallons per acre.
Renovate 3 - 0.250 to 0.750 gallons per acre.
Clearcast - 0.125 to 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons per acre.
Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant.

Biological Control - Release in the vicinity of alligatorweed populations to supplement existing populations of alligatorweed flea beetles

Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$1,500

Potential sources of funding

Horry and Marion Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

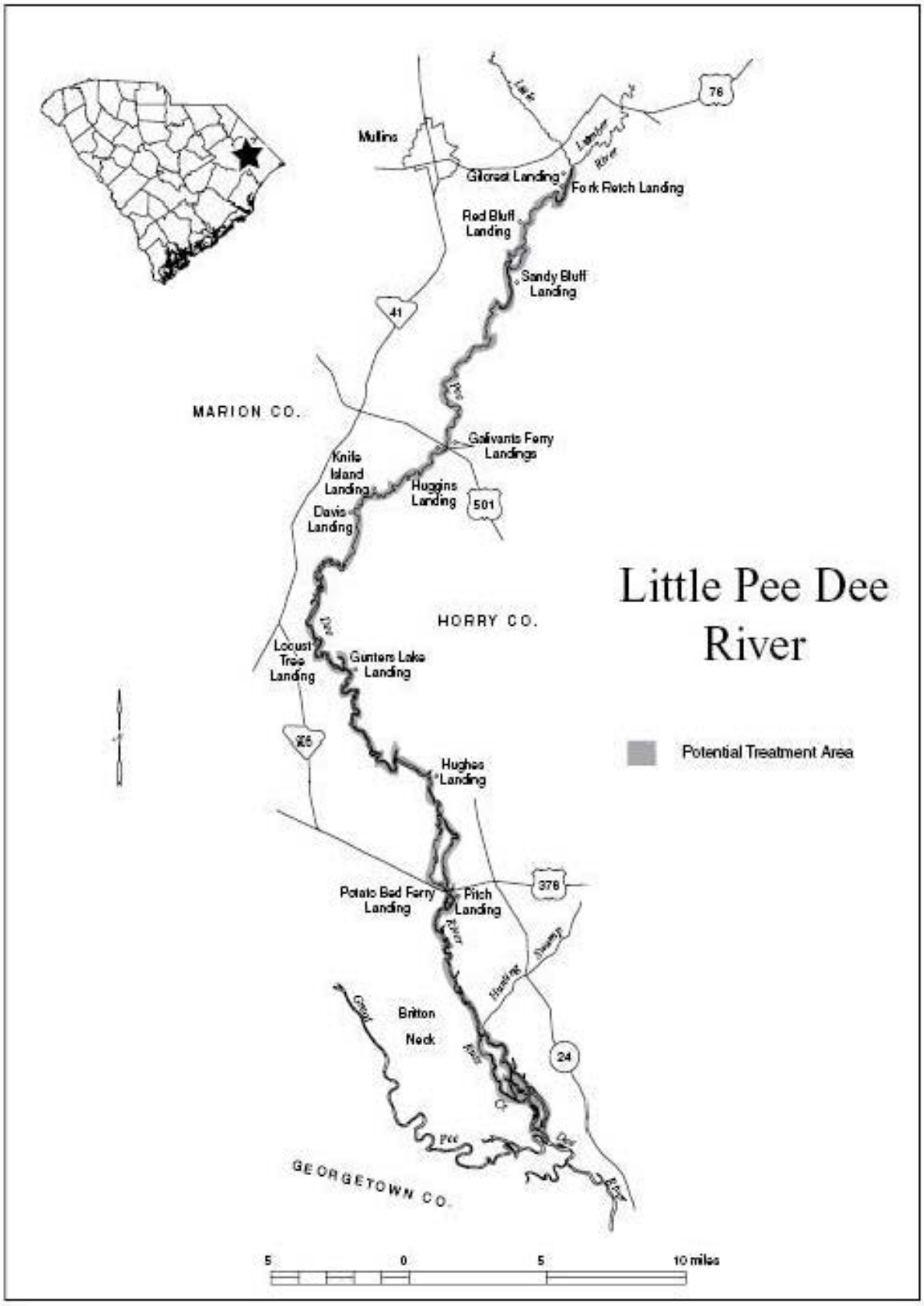
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.


Little Pee Dee River
Potential Treatment Area
Mullins
Gilcrest Landing
Fork Ketch Landing
Red Bluff Landing
Sandy Bluff Landing
MARION CO.
Galivants Ferry Landings
Knife Island Landing
Huggins Landing
Davis Landing
HORRY CO.
Locust Tree Landing
Gunters Lake Landing
Hughes Landing
Potato Bed Ferry Landing
Pitch Landing
Britton Neck
GEORGETOWN CO.
76
41
501
378
24
5
0
5
10 miles

20. Lumber River (Marion and Horry Counties)

Problem plant species

Alligatorweed

Management objective

Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.

Selected control method

Herbicides - Renovate 3, Habitat, Clearcast, Glyphosate, Galleon SC

Biological Control - Alligatorweed flea beetles, *Agasicles hygrophila*

Area to which control is to be applied

20 5acres of problematic plants throughout river

Rate of control agent to be applied

Renovate 3 - 0.500 to 0.750 gallons per acre.

Habitat - 0.250 to 0.750 gallons per acre.

Clearcast - 0.250 to 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant.

Biological Control - Release in the vicinity of alligatorweed populations to supplement existing populations of alligatorweed flea beetles

Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$500

Potential sources of funding

Horry and Marion Counties 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

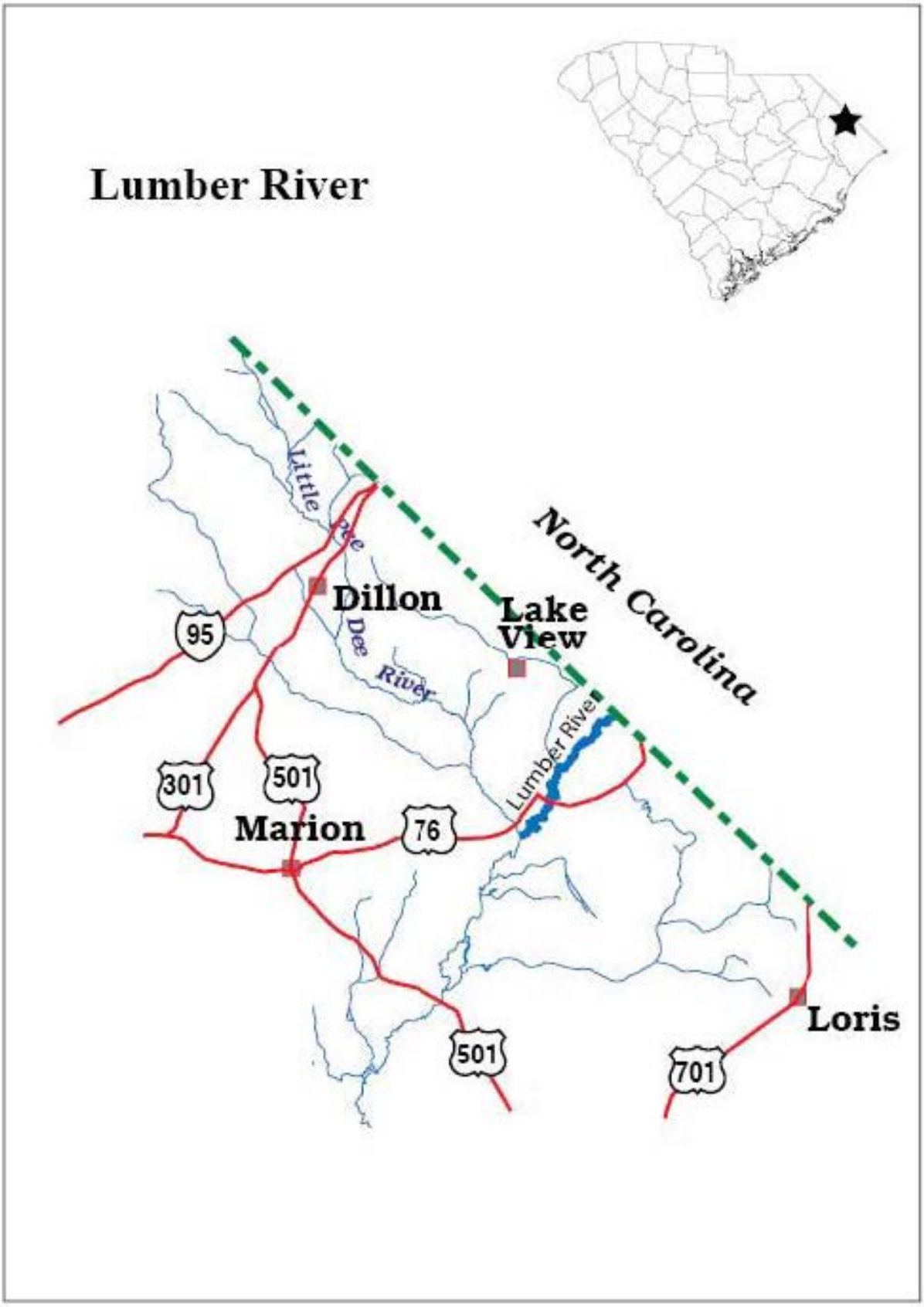
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.


Lumber River
North Carolina
Little Pee Dee River
Dillon
Lake View
Lumber River
95
301
501
Marion
76
501
701
Loris

21. Pee Dee River (Georgetown County)

Problem plant species

Water hyacinth, Phragmites

Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

Selected control method

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Habitat, Galleon SC
Phragmites	Habitat, Glyphosate, Clearcast

Area to which control is to be applied

35 acres of water hyacinth throughout river and adjacent public ricefields.

5 acres of phragmites in the Sandy Island area.

Rate of control agent to be applied

Reward - 0.500 gallons per acre.
Glyphosate – up to 0.937 gallons per acre
Renovate 3 - 0.500 to 0.750 gallons per acre.
Habitat - 0.250 to 0.750 gallons per acre.
Clearcast - 0.250 to 0.750 gallons per acre.
Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

Method of application of control agent

Helicopter, airboat - 35 acres of herbicide applied to water hyacinth (Sandy Island Area 10 acres). 5 acres of Habitat applied to phragmites (Sandy Island Area 5 acres).

Timing and sequence of control application

Reward, Renovate 3, Clearcast, Habitat, Glyphosate, Galleon SC - to be applied periodically to water hyacinth from May through October.

Habitat, Clearcast, Glyphosate - Apply when plants are actively growing.

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$6,500

Potential sources of funding

Georgetown County 50%

U.S. Army Corps of Engineers 0%S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

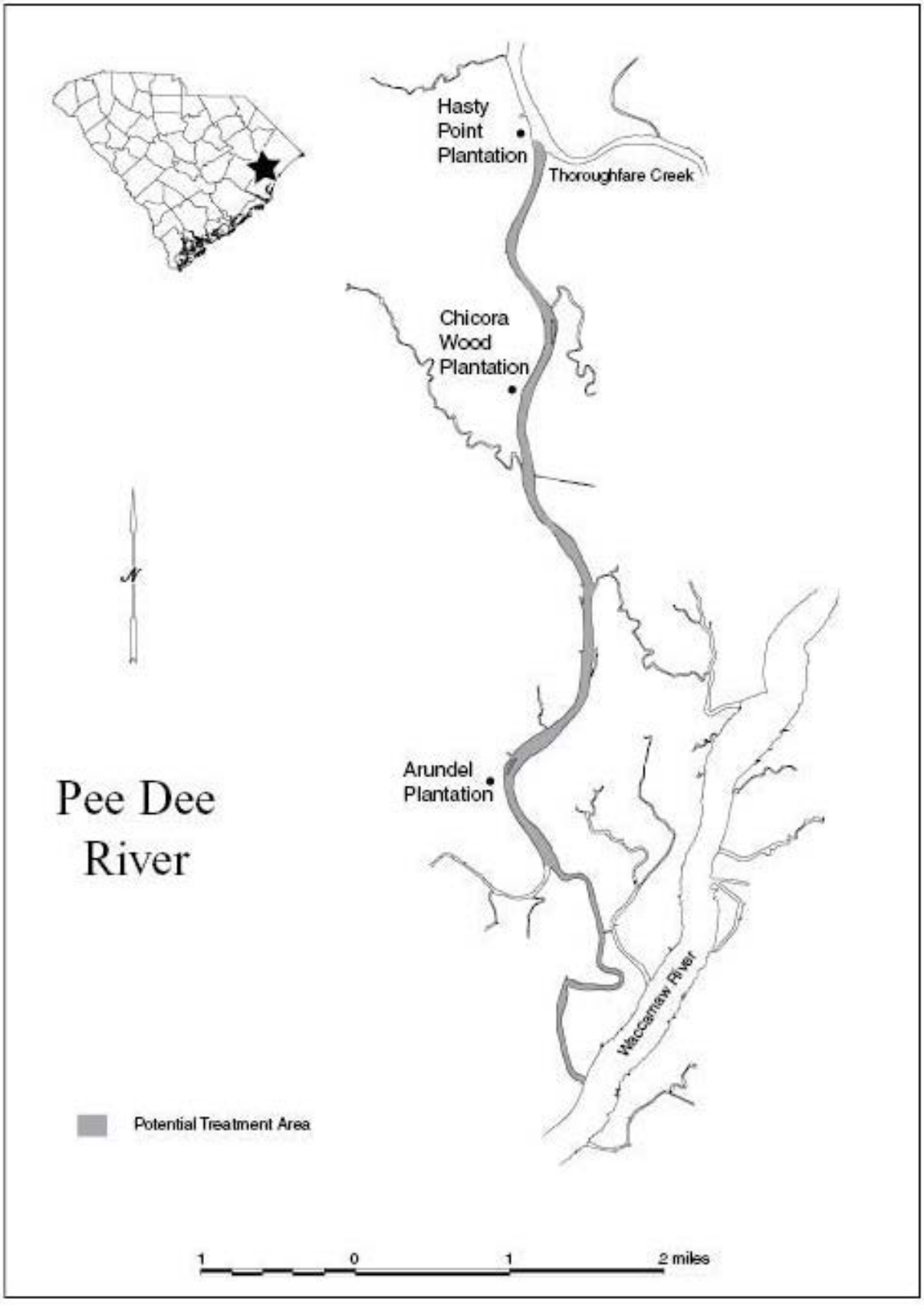
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Hasty
Point
Plantation
Thoroughfare Creek
Chicora
Wood
Plantation
N
Pee Dee
River
Arundel
Plantation
Waccamaw River
Potential Treatment Area
1
0
1
2 miles

22. Samworth WMA (Georgetown County)

Problem plant species

Water hyacinth, Phragmites

Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

Selected control method

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Habitat, Galleon SC
Phragmites	Habitat, Clearcast, Glyphosate

Area to which control is to be applied

40 acres of water hyacinth throughout river and adjacent public ricefields.

10 acres of phragmites in the Sandy Island area and Samworth WMA.

Rate of control agent to be applied

Reward - 0.500 gallons per acre.
Renovate 3 - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Habitat - 0.250 to 0.750 gallons per acre.
Clearcast - 0.250 to 0.750 gallons per acre.
Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

Method of application of control agent

Helicopter, airboat - 40 acres of herbicide applied to water hyacinth. 10 acres of Habitat, Glyphosate applied to phragmites.

Timing and sequence of control application

Reward, Renovate 3, Clearcast, Habitat, Glyphosate, Galleon SC - to be applied periodically to water hyacinth from May through October.

Habitat, Clearcast, Glyphosate - Apply when plants are actively growing.

Other control application specifications

None

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$5,514

Potential sources of funding

Samworth WMA 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

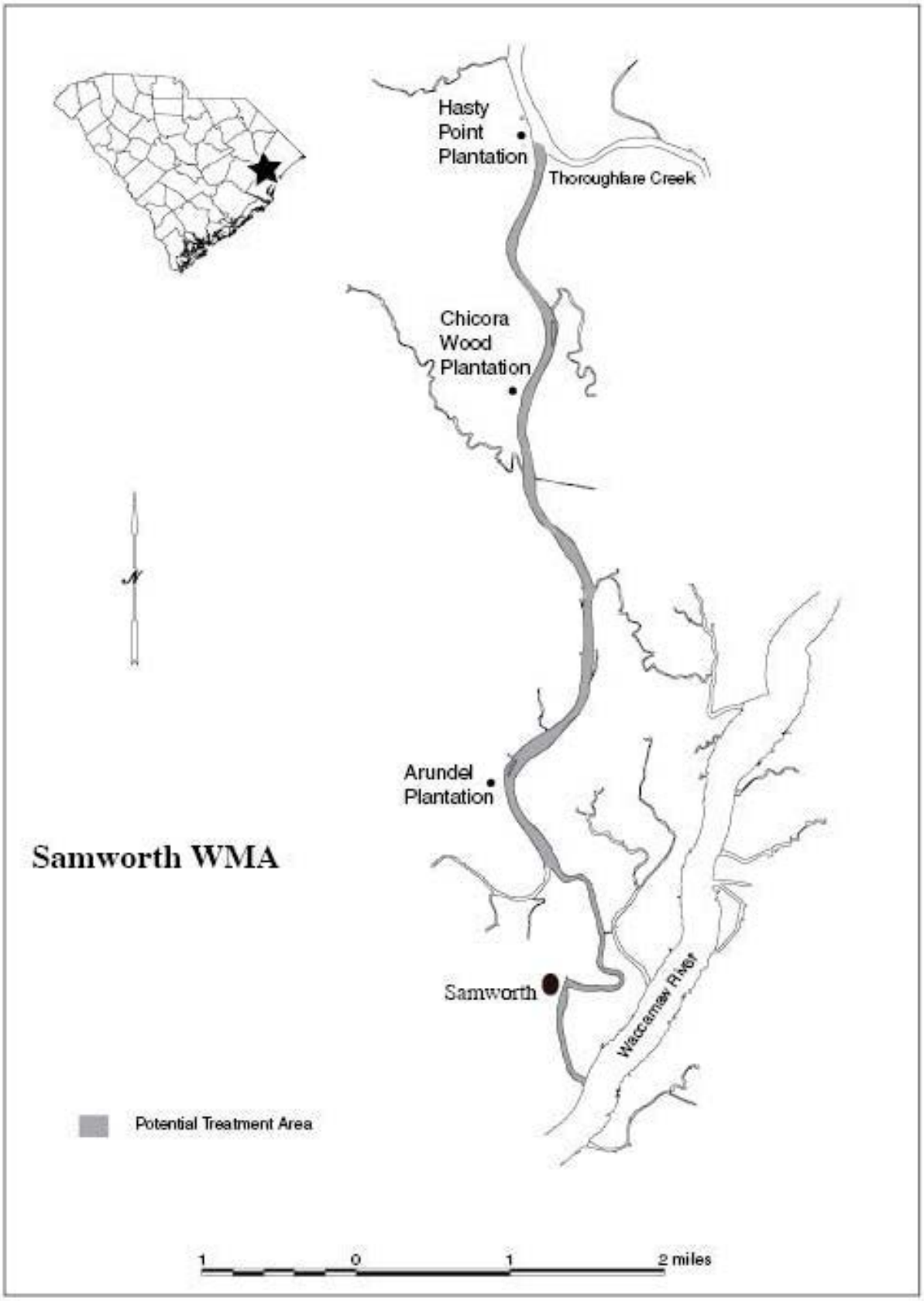
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Hasty
Point
Plantation
Thoroughfare Creek
Chicora
Wood
Plantation
N
Arundel
Plantation
Samworth WMA
Samworth
Waccamaw River
Potential Treatment Area
1
0
1
2 miles

23. Santee Coastal Reserve (Charleston and Georgetown Counties)

Problem plant species

Phragmites

Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible throughout the Santee Coastal Reserve.

Selected control method

Habitat, Clearcast, Glyphosate

Area to which control is to be applied

300 acres of phragmites throughout the ricefields.

Rate of control agent to be applied

Habitat - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Clearcast - 0.500 to 0.750 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

Other control application specifications

Application to be conducted by ground application or airboat. Helicopter applications should be utilized at a minimum of every 3 years or when substantial regrowth occurs.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$31,000

Potential sources of funding

Santee Coastal Reserve 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

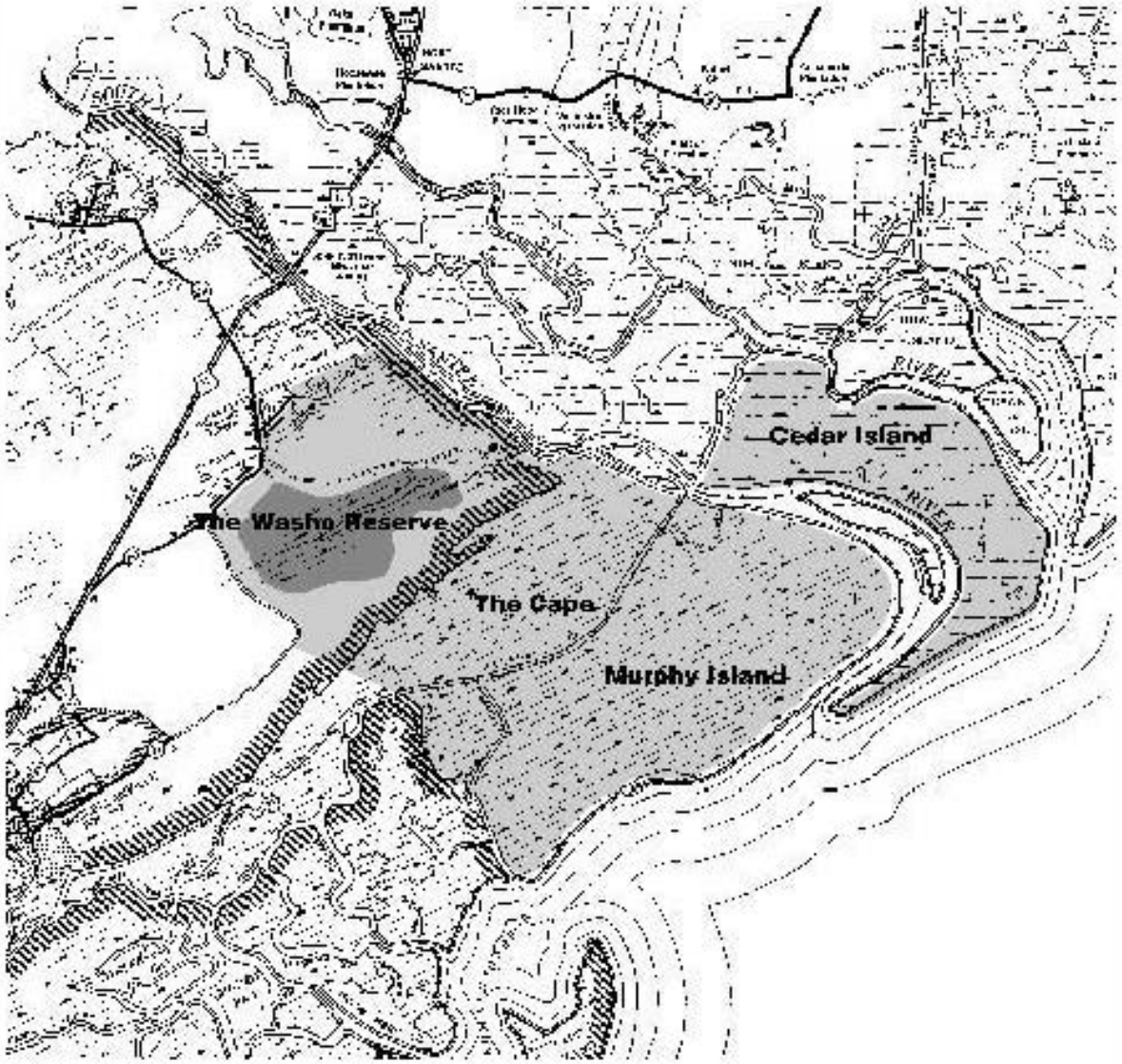
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

Santee Coastal Reserve



24. Santee Delta WMA (Georgetown County)

Problem plant species

Phragmites

Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible.

Selected control method

Habitat, Clearcast, Glyphosate

Area to which control is to be applied

10 acres of Phragmites throughout the ricefields.

Rate of control agent to be applied

Habitat - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre
Clearcast - 0.500 to 0.750 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

Other control application specifications

Application to be conducted by ground application or airboat. Helicopter applications should be utilized at a minimum of every 3 years or when substantial regrowth occurs.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$1,064

Potential sources of funding

Santee Coastal Reserve 50%

U.S. Army Corps of Engineers 0%

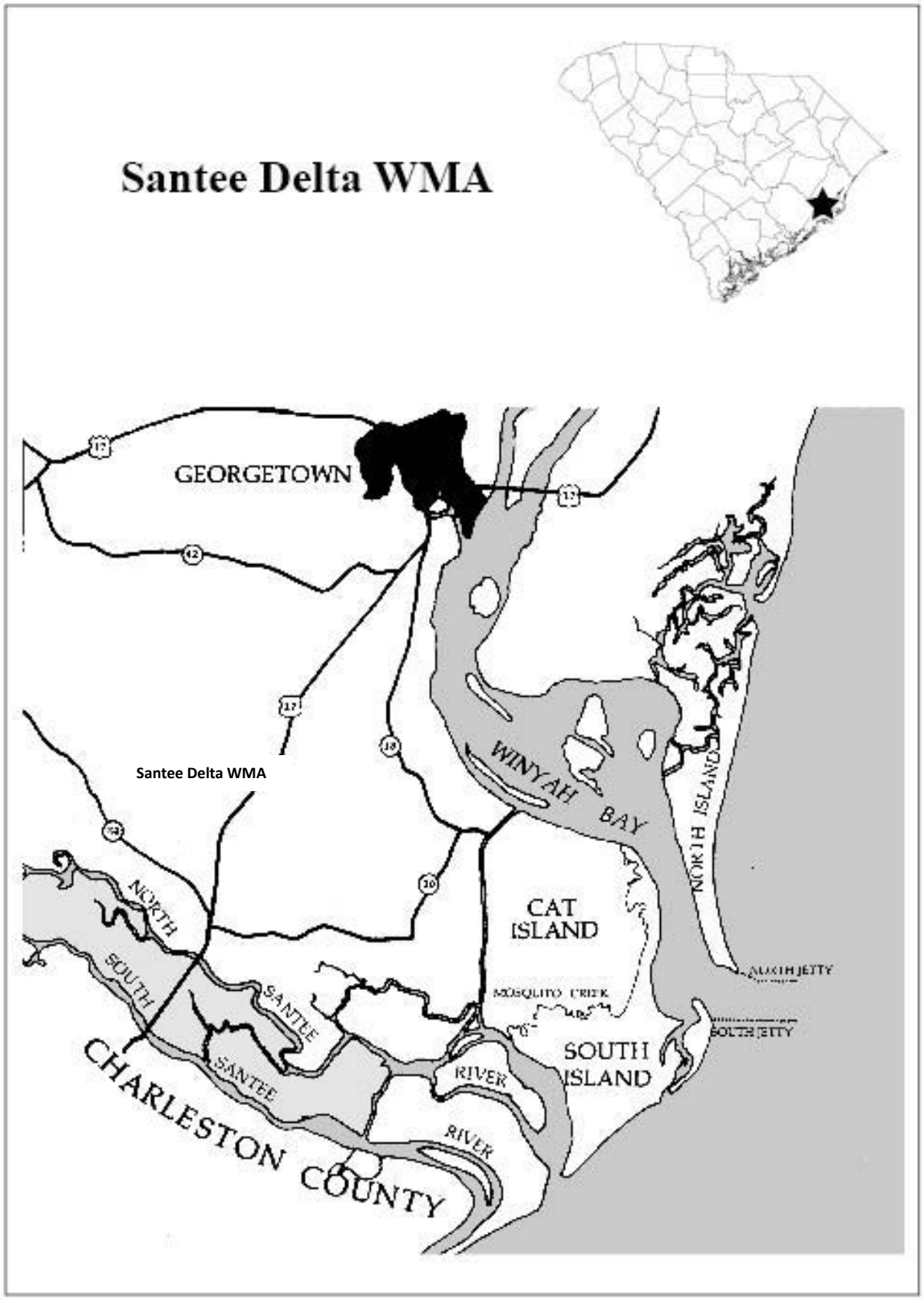
S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.


Santee Delta WMA
GEORGETOWN
Santee Delta WMA
WINYAH BAY
NORTH ISLAND
CAT ISLAND
MOSQUITO CREEK
SOUTH ISLAND
NORTH SANTEE RIVER
SOUTH SANTEE RIVER
CHARLESTON COUNTY

25. U.S. Army Corps of Engineers
Charleston Harbor/Intracoastal Waterway
(Charleston County)

Problem plant species

Phragmites

Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible

Selected control method

Problem Species	Control Agent
Phragmites	Habitat, Clearcast, Glyphosate

Area to which control is to be applied

200 acres of phragmites throughout area

Rate of control agent to be applied

Habitat - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Clearcast – 0.500 to 0.75 gallons per acre.

Method of application of control agent

Helicopter - 200 acres of Habitat applied to phragmites.

Other applications - Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply when plants are actively growing (July - Oct.).

Entity to apply control agent

Commercial applicator

Other control application specifications

None

Estimated cost of control operations

$21,288

Potential sources of funding

U.S. Army Corps of Engineers (Charleston Harbor Funds) 100%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

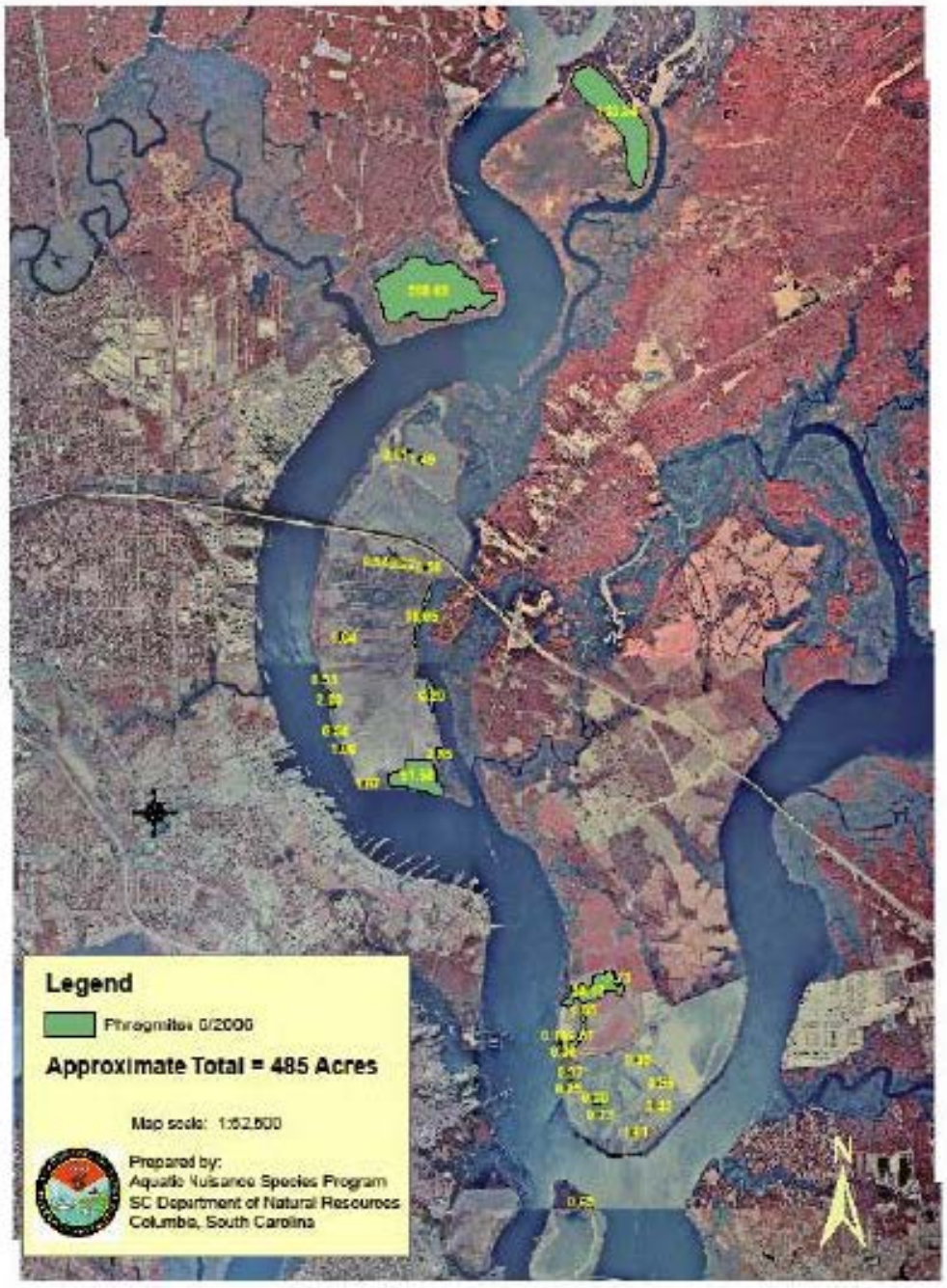
a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

d) Continue to coordinate treatment areas with local conservation groups.

Charleston Harbor Dredge Spoil Areas



26. US Navy, Naval Weapons Station (Charleston, Berkeley County)

Problem plant species

Phragmites

Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible in spoil areas and control invasive.

Selected control method

Problem Species	Control Agent
Phragmites	Habitat, Clearcast, Glyphosate

Area to which control is to be applied

50 acres of Phragmites populations in dredge spoil areas.

Rate of control agent to be applied

Habitat - 0.500 to 0.750 gallons per acre.
Clearcast - 0.500 to 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

Other control application specifications

Application to be conducted by helicopter, airboat and jon-boat.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$5,322

Potential sources of funding

US Naval Weapons Station 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

US Navy Naval Weapons Station

NO MAP AVAILABLE

27. Waccamaw River (Horry County)

Problem plant species

Water hyacinth, Phragmites

Management objective

Through a comprehensive, multi-year approach; reduce water hyacinth and Phragmites populations to the greatest extent possible

Selected control method

Problem Species	Control Agents
Water hyacinth	Reward, Renovate 3, Clearcast, Galleon SC
Phragmites	Habitat, Clearcast

Area to which control is to be applied

50 acres throughout river system where needed.

Rate of control agent to be applied

Reward - 0.500 gallons per acre.
Renovate 3 - 0.500 to 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.
Habitat - 0.500 to 0.750 gallons per acre.
Clearcast - 0.500 to 0.750 gallons per acre.
Galleon SC - 2 to 6 fluid ounces per acre as foliar application.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Herbicide to be applied to water hyacinth periodically from late May through November.

Other control application specifications

Herbicide used only upon approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$ 4,000

Potential sources of funding

Horry County 25%

Brookgreen Gardens 25%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

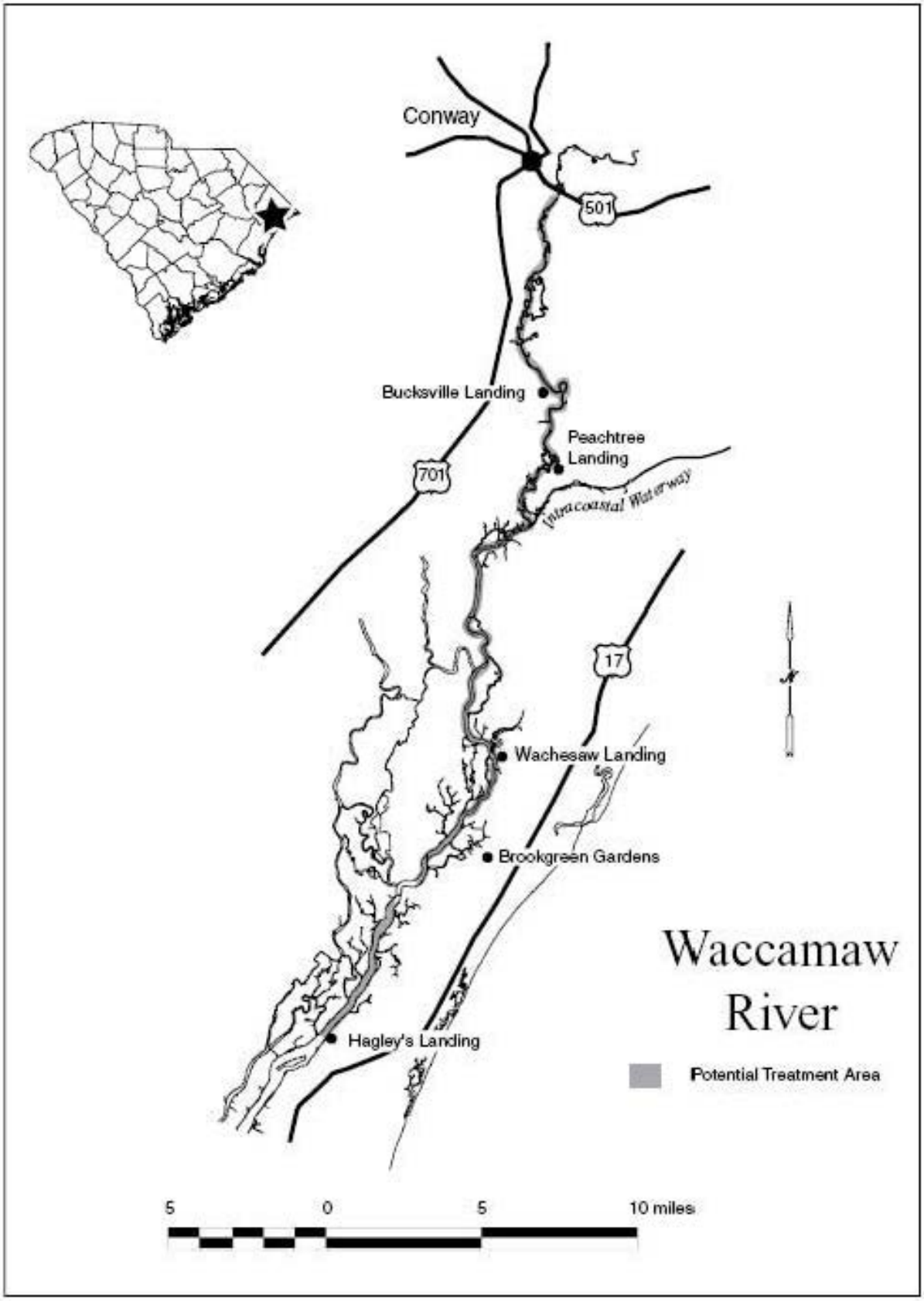
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Conway
501
Bucksville Landing
Peachtree
Landing
701
Intracoastal Waterway
17
Wachesaw Landing
Brookgreen Gardens
Hagley's Landing
Waccamaw
River
Potential Treatment Area
5
0
5
10 miles

28. Yawkey Wildlife Center (Georgetown County)

Problem plant species

Phragmites, Cattails, Cutgrass

Management objective

Through a comprehensive, multi-year approach; reduce Phragmites populations to the greatest extent possible.

Selected control method

Habitat, Clearcast, Glyphosate

Area to which control is to be applied

25 acres of Phragmites, cattails, and cutgrass throughout the ricefields.

Rate of control agent to be applied

Habitat - 0.500 to 0.750 gallons pints per acre.
Clearcast - 0.500 to 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons per acre

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

Other control application specifications

Application to be conducted by airboat, ground, or helicopter. Phragmites control in impounded areas should only occur where drainage has left areas moderately dry

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$2,661

Potential sources of funding

Yawkey Foundation 50%

U.S. Army Corps of Engineers 0%

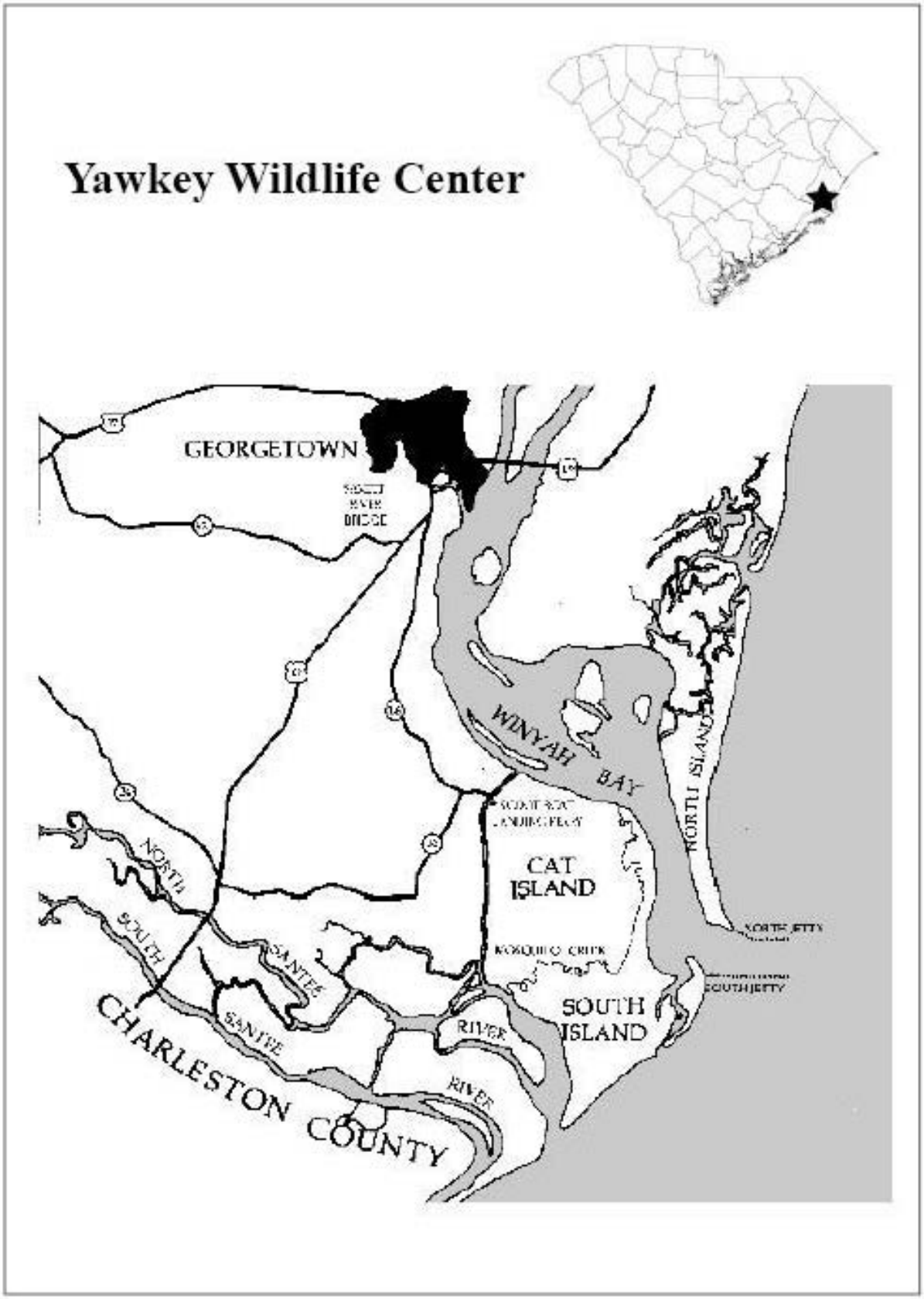
S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.


Yawkey Wildlife Center
GEORGETOWN
WINYAH BAY
NORTH ISLAND
CAT ISLAND
SOUTH ISLAND
NORTH SANTEE RIVER
SOUTH SANTEE RIVER
CHARLESTON COUNTY

Santee Cooper Lakes

29. Lake Marion (Calhoun, Clarendon, Orangeburg, Berkeley, and Sumter Counties)

Problem plant species

Hydrilla, Alligatorweed, Fanwort, Water willow, Water hyacinth, Slender naiad, Water primrose, Giant cutgrass, Coontail, Filamentous algae (Lyngbya), Slender pondweed, Crested floating heart, Fragrant waterlily

Management objectives

Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing non-invasive plant species) and the introduction of desirable native plant species.

Manage hydrilla growth throughout the main lake and subimpoundments to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, agricultural irrigation withdrawals, and public use and access.

Reduce water hyacinth populations throughout the lake to enhance boating, fishing, hunting, public access and prevent spread to other areas of the lake.

Reduce Crested floating heart populations throughout the lake to enhance boating, fishing, hunting, public access and prevent spread to other areas of the lake.

Reduce giant cutgrass populations throughout the lake, especially in the Santee Cooper Wildlife Management Area and upper lake near Lowfalls landing, to enhance wildlife habitat and hunting opportunities.

Reduce fragrant waterlily and alligatorweed populations throughout the Santee Cooper Wildlife Management Area to enhance wildlife habitat and hunting opportunities.

Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and subimpoundments.

Selected control method

Problem Species	Control Agents
Hydrilla	Aquathol K, Sonar, chelated copper*, Triploid grass carp
Lyngbya	chelated copper*, peroxygen compounds
Water hyacinth	Reward, Renovate 3, Clearcast
Fanwort, coontail, slender naiad, slender pondweed	Aquathol K, Sonar, Reward
Water primrose, alligatorweed, giant cutgrass	Glyphosate, Habitat, Renovate 3, Clearcast

Crested floating heart Aquathol K, Clearcast / Glyphosate, Renovate Max G

* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

Area to which control is to be applied

Water hyacinth - Approximately 750 acres throughout lake but mostly in the upper lake area above I-95 bridge.

Hydrilla - Approximately 750 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and sub-impoundments. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest hydrilla growth and use herbicide applications to provide immediate short-term control of localized growth in those areas.

Crested floating heart - Approximately 1500 acres in priority areas such as public and commercial access sites (boat ramps, piers, swimming areas, marinas, and residential shoreline areas in the main lake), and State and Federal wildlife management areas.

Giant Cutgrass - Approximately 100 acres along shoreline areas throughout lake system, as well as within State and Federal wildlife management areas.

Other target species - Approximately 100 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and sub-impoundments.

Sub-Impoundments -

Dean's Swamp Impoundment, Potato Creek Impoundment, Church Branch Impoundment, Taw Caw Impoundment

The general management strategy is to transition from hydrilla dominated plant communities to ones dominated by native plant species, which are beneficial to wildlife, by use of aquatic herbicides. Specific control methods for the sub-impoundments will be determined cooperatively between Santee Cooper and SCDNR staffs. Methods and goals will be consistent with both groups' interests for control of invasive plant species such as hydrilla while promoting vegetation beneficial to wildlife and waterfowl through other habitat enhancement projects.

Rate of control agents to be applied

Aquathol K - 5 to 10 gallons per acre (dependent on water depth).
Reward - 0.500 gallons per acre for floating plants; 2 gallons per acre for submersed plants.
Renovate 3 - 0.500 to 0.750 gallons per acre for emergent species, per label for submersed plants.
Habitat - 0.250 to 0.750 gallons per acre.
Sonar AS - 0.075 to 0.15 ppm.
Chelated Copper- up to 1 ppm.
Glyphosate - up to 1.25 gallons per acre.
Sonar Q, Sonar PR - up to 40 ppb (approx 10 pounds/acre).

Clearcast - 0.250 to 1.00 gallons per acre.
Renovate Max G – up to 320 pounds per acre.

Triploid grass carp – The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in the Santee Cooper Lakes to provide long-term control of hydrilla. A maintenance stocking plan was originally approved in 1999 and provided for stocking a small number of grass carp to control hydrilla while encouraging the expansion of a diverse, native aquatic plant community.

The plan was first implemented in 2007 following a year of substantial increases in hydrilla and overall aquatic plant populations system-wide. The maintenance stocking plan called for increasing the grass carp population to the level at which hydrilla was last under control, which appeared to be in 2005, and maintaining that level in subsequent years. Drought conditions resulted in a decrease in lake levels to near historic lows in early 2008, so no grass carp were stocked that year. However, supplemental stocking was resumed in 2009 bringing the estimated total grass carp population to 12,074.

Concerned about the rate of hydrilla spread in the past three years using the current maintenance stocking plan, DNR and Santee Cooper biologists reviewed approaches in other lakes. Recent experience gained in several North Carolina lakes indicated that a maintenance stocking rate of one fish for every eight surface acres appears to keep hydrilla regrowth suppressed following initial control. When applied to Lakes Marion and Moultrie, this rate was about 20,000 grass carp for both lakes combined. This target stocking rate is higher than calculated by the original stocking plan developed in 1999 but it reflects research and experience not available at that time. In 2010 12,000 fish were stocked to bring the new threshold level to 20,000. Year end surveys in 2010 indicated another increase in hydrilla regrowth, an additional 400 acres had occurred in Lake Marion and Moultrie.

Based on this information, the Aquatic Plant Management Council, with recommendations from DNR and Santee Cooper staff, along with input from the Aquatic Plant Management Council members, agreed that the current maintenance stocking plan to maintain a grass carp population of one fish per eight total surface acres, stocking 6400 carp yearly, should be continued. The parties mentioned above also concluded that additional stocking should be implemented to reduce the increases in hydrilla acreage seen in 2010(400 acres). An additional stocking of 10,000 sterile grass carp will be stocked to bring the rate for the additional hydrilla acreage up to a control level of 25 fish per 1 acre of hydrilla. This strategy would bring the total sterile grass carp stocked in 2011 to 16, 400 and should provide control of hydrilla without impacting the abundant native vegetation which is now being displaced by hydrilla.

SCDNR and Santee Cooper Staff will carefully monitor Lake Marion and Lake Moultrie for additional increases in hydrilla acreage or loss of native vegetation. Herbicide treatments will be used to provide temporary control of hydrilla until results from grass carp feeding become apparent. Changes to the maintenance stocking strategy will be considered if survey results, regrowth, or habitat loss warrant.

Method of application of control agents

Aquathol K, chelated copper, Sonar - subsurface application by airboat or surface application by helicopter.

Reward - (water hyacinth) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant ;(submersed plants) subsurface application.

Renovate 3, Glyphosate, Habitat, Clearcast - spray on surface of foliage with appropriate surfactant.

Renovate Max G – Distribute granular product evenly over the surface at the prescribed rate.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Timing and sequence of control application

Herbicide applications - All herbicide applications to be applied when plants are actively growing. Water hyacinth treatments should be initiated in early spring when plant growth begins and continued regularly during the year as needed.

Triploid grass carp to be released as soon as possible in the spring of 2011 (March-May). RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Hydrilla, Water hyacinth and Crested floating heart treatments should be considered a high priority to minimize spread to other areas of the lake system. Treatments should be conducted wherever the plants occur and access by boat is feasible. Areas inaccessible by boat or large acreages will be treated aerially. Frequent treatments in these areas will be necessary to meet management objectives.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Lake Marion will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

Entity to apply control agents

Herbicide application - S.C. Public Service Authority and/or commercial applicator.

Triploid Grass Carp -

Commercial supplier with supervision by S.C. Public Service Authority and/or SCDNR.

Estimated cost of control operations

$650,000.00

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2011

Potential sources of funding

S.C. Public Service Authority 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in a minimum of 10% of the total surface area of the lake and to effectively control non-native invasive species.

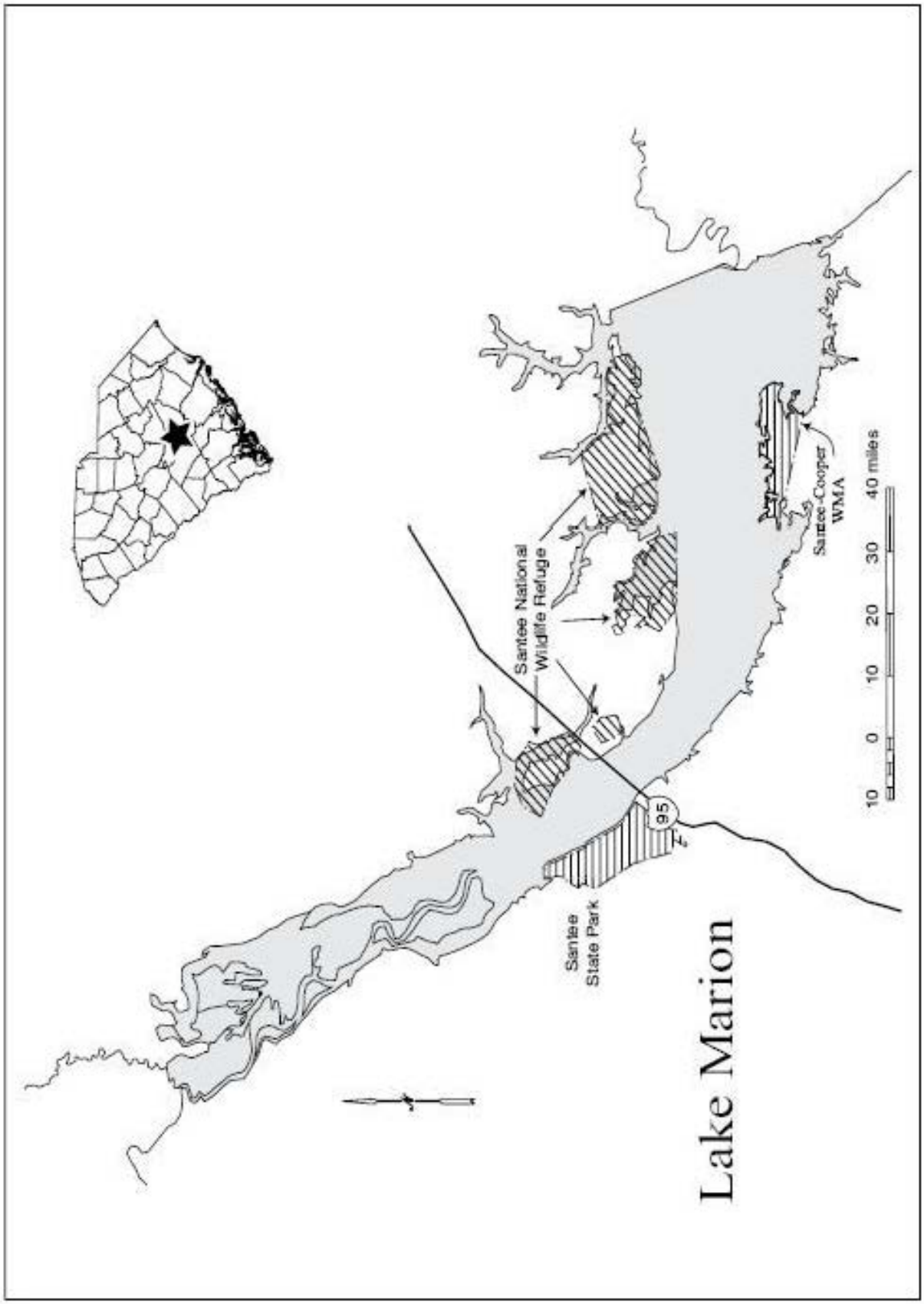
b) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

c) A long-term integrated management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual maintenance stocking of grass carp to maintain the population at a level that is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.

d) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

e) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

f) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.


Lake Marion
Santee National Wildlife Refuge
Santee State Park
Santee-Cooper WMA
95
10 0 10 20 30 40 miles

30. Lake Moultrie (Berkeley County)

Problem plant species

Hydrilla, Slender naiad, Watermilfoil, Water willow, Water primrose, Alligatorweed, Fanwort, Water hyacinth, Crested floating heart, Giant cutgrass

Management objectives

Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing non-invasive plant species) and the introduction of desirable native plant species.

Manage hydrilla growth throughout the main lake and subimpoundments to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, agricultural irrigation withdrawals, and public use and access.

Reduce water hyacinth and Crested floating heart populations throughout the lake to enhance boating, fishing, hunting, public access and prevent spread to other areas of the lake.

Reduce giant cutgrass populations throughout the lake to enhance wildlife habitat and hunting opportunities.

Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas.

Selected control method

Problem Species	Control Agents
Hydrilla	Aquathol K, Sonar, chelated Copper*, Triploid grass carp
Water hyacinth	Reward, Renovate 3, Clearcast
Fanwort, slender naiad, watermilfoil	Aquathol K, Sonar, Reward, Renovate 3
Water primrose, alligatorweed, giant cutgrass	Glyphosate, Habitat, Renovate 3, Clearcast
Crested floating heart	Aquathol K, Clearcast / Glyphosate, Renovate Max G

* May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.

Area to which control is to be applied

Hydrilla, fanwort, watermilfoil - Approximately 500 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas and sub-impoundments. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with

the greatest hydrilla growth and use herbicide applications to provide immediate short-term control of localized growth in those areas.

Giant cutgrass, water primrose, alligatorweed - Approximately 100 acres along shoreline areas throughout the lake.

Sub -Impoundments - Stoney Bay Impoundment - The general management strategy is to transition from hydrilla dominated plant communities to ones dominated by native plant species, which are beneficial to wildlife, by use of aquatic herbicides. Specific control methods for the sub-impoundments will be determined cooperatively between Santee Cooper and SCDNR staffs. Methods and goals will be consistent with both groups' interests for control of invasive plant species such as hydrilla while promoting vegetation beneficial to wildlife and waterfowl through other habitat enhancement projects.

Rate of control agents to be applied

Aquathol K 5 up to 10 gallons per acre (dependent on water depth).
Reward - 0.500 gallon per acre for floating plants; two gallons per acre for submersed plants.
Renovate 3 - 0.500 to 0.750 gallons per acre for emergent species, per label for submersed plants.
Habitat - 0.250 to 0.750 gallons per acre.
Sonar AS - 0.075 to 0.15 ppm in treatment area.
Chelated copper - up to 1 ppm Glyphosate- up to 1.25 gallons per acre.
Sonar Q, Sonar PR - up to 40 ppb (approx 10 pounds/acre), Clearcast - 0.250 to 1.00gallons per acre.
Renovate Max G – up to 320 pounds per acre.
Other approved aquatic herbicides - as per label instructions.

Triploid grass carp – The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in the Santee Cooper Lakes to provide long-term control of hydrilla. A maintenance stocking plan was originally approved in 1999 and provided for stocking a small number of grass carp to control hydrilla while encouraging the expansion of a diverse, native aquatic plant community.

The plan was first implemented in 2007 following a year of substantial increases in hydrilla and overall aquatic plant populations system-wide. The maintenance stocking plan called for increasing the grass carp population to the level at which hydrilla was last under control, which appeared to be in 2005, and maintaining that level in subsequent years. Drought conditions resulted in a decrease in lake levels to near historic lows in early 2008, so no grass carp were stocked that year. However, supplemental stocking was resumed in 2009 bringing the estimated total grass carp population to 12,074.

Concerned about the rate of hydrilla spread in the past three years using the current maintenance stocking plan, DNR and Santee Cooper biologists reviewed approaches in other lakes. Recent experience gained in several North Carolina lakes indicated that a maintenance stocking rate of one fish for every eight surface acres appears to keep hydrilla regrowth suppressed following initial control. When applied to Lakes Marion and Moultrie, this rate was about 20,000 grass carp for both lakes combined. This target

stocking rate is higher than calculated by the original stocking plan developed in 1999 but it reflects research and experience not available at that time. In 2010 12,000 fish were stocked to bring the new threshold level to 20,000. Year end surveys in 2010 indicated another increase in hydrilla regrowth, an additional 400 acres had occurred in Lake Marion and Moultrie.

Based on this information, the Aquatic Plant Management Council, with recommendations from DNR and Santee Cooper staff, along with input from the Aquatic Plant Management Council members, agreed that the current maintenance stocking plan to maintain a grass carp population of one fish per eight total surface acres, stocking 6400 carp yearly, should be continued. The parties mentioned above also concluded that additional stocking should be implemented to reduce the increases in hydrilla acreage seen in 2010(400 acres). An additional stocking of 10,000 sterile grass carp will be stocked to bring the rate for the additional hydrilla acreage up to a control level of 25 fish per 1 acre of hydrilla. This strategy would bring the total sterile grass carp stocked in 2011 to 16, 400 and should provide control of hydrilla without impacting the abundant native vegetation which is now being displaced by hydrilla.

SCDNR and Santee Cooper Staff will carefully monitor Lake Marion and Lake Moultrie for additional increases in hydrilla acreage or loss of native vegetation. Herbicide treatments will be used to provide temporary control of hydrilla until results from grass carp feeding become apparent. Changes to the maintenance stocking strategy will be considered if survey results, regrowth, or habitat loss warrant.

Method of application of control agents

Aquathol K, chelated copper, Sonar - subsurface application by airboat or surface application by helicopter.

Reward - (water hyacinth) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant ;(submersed plants) subsurface application.

Renovate 3, Glyphosate, Habitat, Clearcast - spray on surface of foliage with appropriate surfactant.

Renovate Max G – Distribute granular product evenly over the surface at the prescribed rate.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Timing and sequence of control application

Herbicide applications - All herbicide applications are to be applied when plants are actively growing. Water hyacinth treatments should be initiated in early spring when plant growth begins and continued regularly during the year as needed.

Triploid grass carp are to be released as soon as possible in the spring of 2011 (March-May). RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.

Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Hydrilla, Water hyacinth and Crested floating heart treatments should be considered a high priority to minimize spread to other areas of the lake system. Treatments should be conducted wherever the plants occur and access by boat is feasible. Areas inaccessible by boat or large acreages will be treated aerially. Frequent treatments in these areas will be necessary to meet management objectives.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments for Lake Marion will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

Entity to apply control agent

Herbicide application - S.C. Public Service Authority and/or commercial applicator.

Triploid Grass Carp - Commercial supplier with supervision by S.C. Public Service Authority and/or SCDNR.

Estimated cost of control operations

$175,000

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2011

Potential sources of funding

S.C. Public Service Authority 50%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in a minimum of 10% of the total surface area of the lake and to effectively control non-native invasive species.

b) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

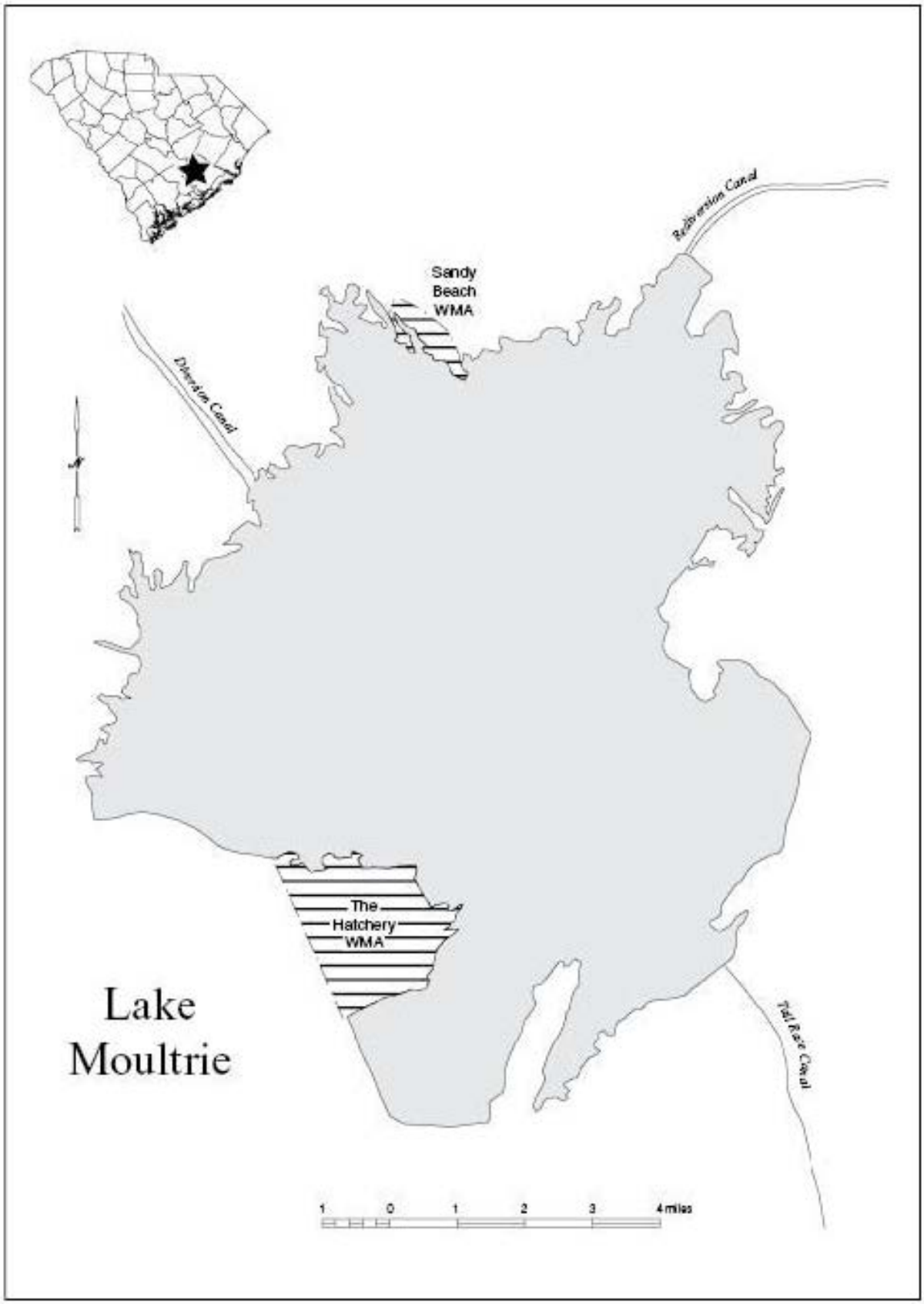
c) A long-term integrated management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include annual maintenance stocking of grass carp to maintain the population at a level that

is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.

d) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

e) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the waterbody, and enforcement of existing laws and regulations.

f) Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.


Sandy
Beach
WMA
Diversion Canal
The
Hatchery
WMA
Lake
Moultrie
1 0 1 2 3 4 miles

South Carolina Department of Parks, Recreation and Tourism
State Park Lakes

31. Barnwell State Park (Swimming Lake) (Barnwell County)

Problem plant species

Waterlily, Cattails

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Waterlily – Renovate Max G

Cattails – Habitat, Glyphosate

Area to which control is to be applied

5 acres in swimming lake.

Rate of control agent to be applied

Renovate Max G – 200 lbs per acre.
Habitat – 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.

Method of application of control agent

Foliar application using appropriate surfactant from airboat. Granular herbicides spread evenly using appropriate rate.

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

Estimated cost of control operations

$900

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

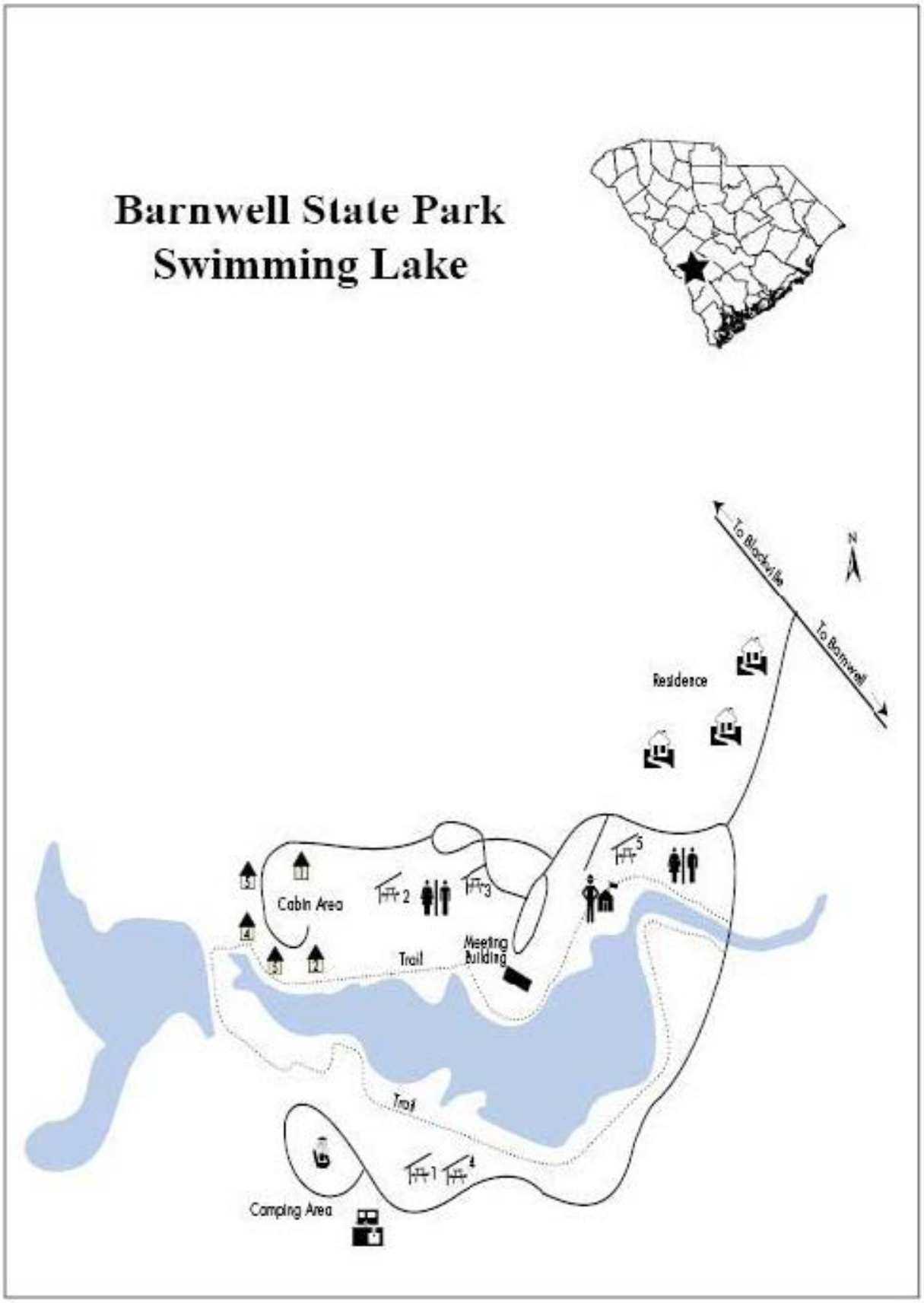
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Barnwell State Park
Swimming Lake
To Blackville
To Barnwell
N
Residence
Cabin Area
Trail
Meeting Building
Trail
Camping Area

32. Charles Towne Landing State Park (Charleston County)

Problem plant species

Duckweed, Alligatorweed, Pennywort

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Problems species	Control Agent
Duckweed	Fluridone, Galleon SC
Alligatorweed	Renovate 3, Habitat, Clearcast, Glyphosate
Pennywort	Renovate 3, Habitat, Clearcast, Glyphosate

Area to which control is to be applied

Fluridone, Galleon SC - 3 acres

Renovate 3, Habitat, Clearcast, Glyphosate - 4 acres

Rate of control agents to be applied

Fluridone - 0.125 gallons per acre.
Habitat – 0.250 – 0.750 gallons per acre.
Clearcast – 0.500 – 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons per acre.
Renovate - 0.500 to 0.750 gallons per acre.
Galleon SC - 2 to 12 fl oz per acre.

Method of application of control agents

Fluridone, Galleon SC - Apply subsurface throughout lake

Glyphosate, Renovate - Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application.

Herbicides to be applied when plants are actively growing

Other control application specifications

None

Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

Estimated cost of control operations

$1070

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

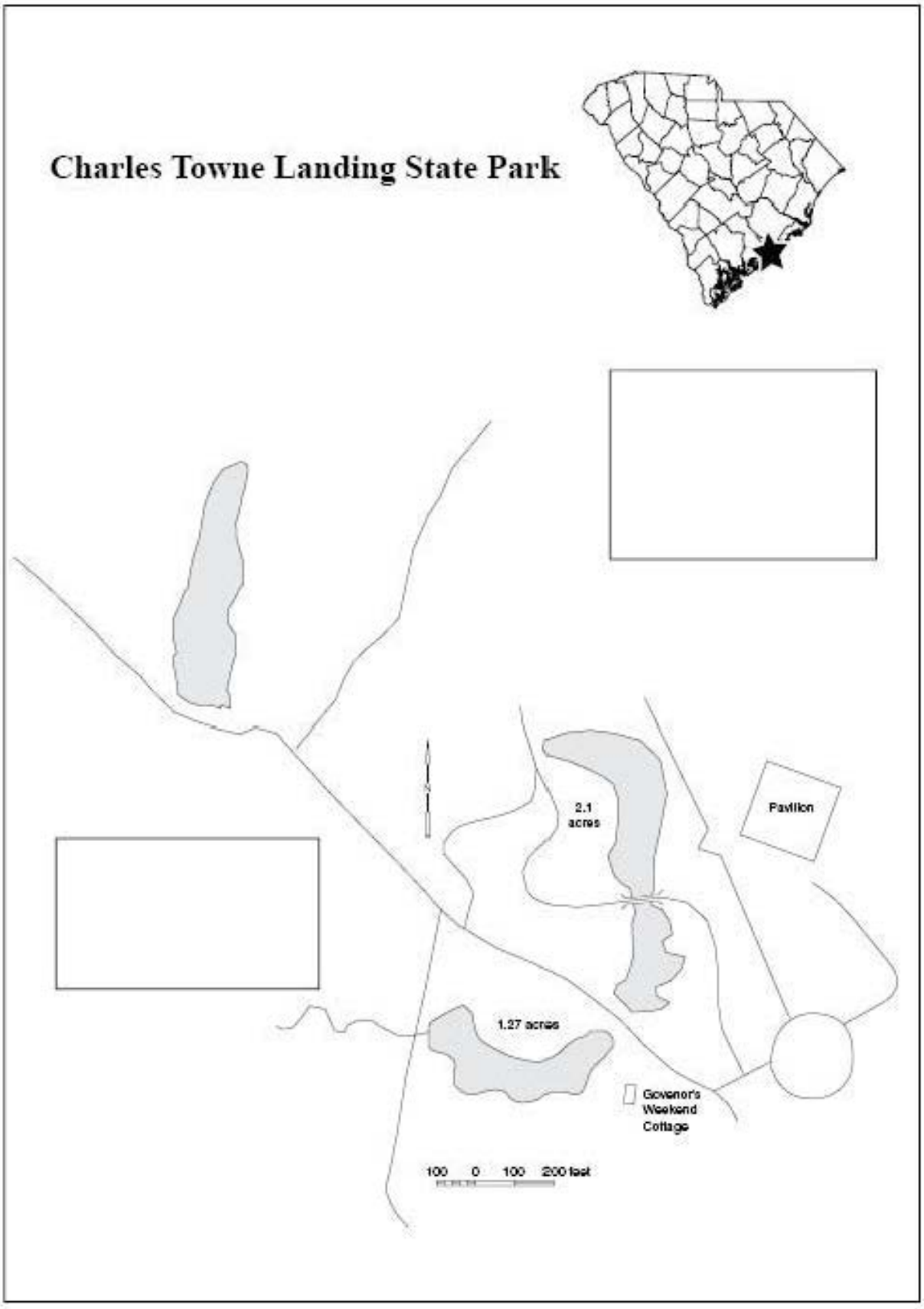
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Charles Towne Landing State Park
2.1
acres
Pavilion
1.27 acres
Governor's
Weekend
Cottage
100 0 100 200 feet

33. H. Cooper Black State Recreation Area (Chesterfield County)

Problem plant species

Waterlily, Watershield

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Hardball, Habitat, Clearcast, Glyphosate

Area to which control is to be applied

2 acres in lake.

Rate of control agent to be applied

Habitat – 0.250 – 0.750 gallons per acre.
Clearcast – 0.500 – 0.750 gallons per acre.
Glyphosate - up to 0.937 gallons per acre.
Hardball – up to 5 gallons per acre.

Method of application of control agent

Subsurface injection from airboat.

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

Estimated cost of control operations

$362

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

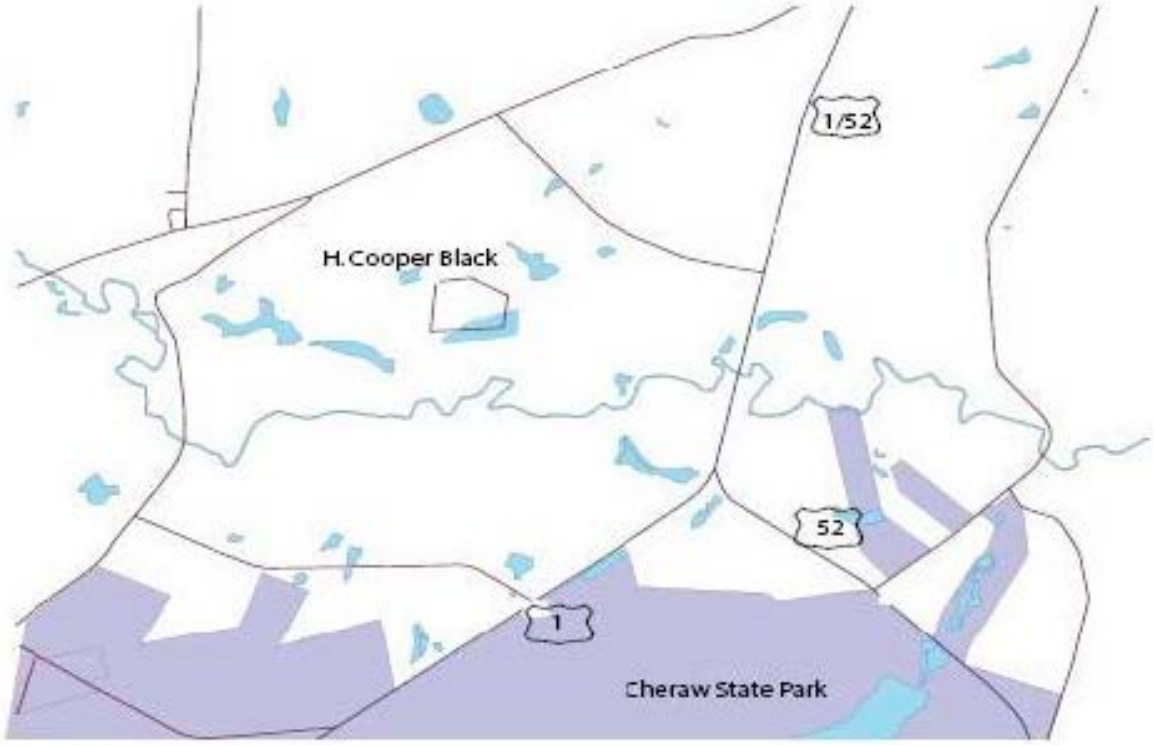
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

H. Cooper Black Recreation Area



34. Huntington Beach State Park (Georgetown County)

Problem plant species

Phragmites, Cutgrass, Cattails

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Habitat, Clearcast, Glyphosate

Area to which control is to be applied

15 acres in 3 different lakes.

Rate of control agent to be applied

Habitat - 0.500 – 0.750 gallons per acre.

Clearcast - 0.500 – 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

Timing and sequence of control application

Apply after plants are actively growing (May - Oct.).

Other control application specifications

Application to be conducted by airboat, ground, or helicopter. Phragmites control in impounded areas should only occur where drainage has left areas moderately dry

Entity to apply control agent

Commercial applicator

Estimated cost of control operations

$1,162

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

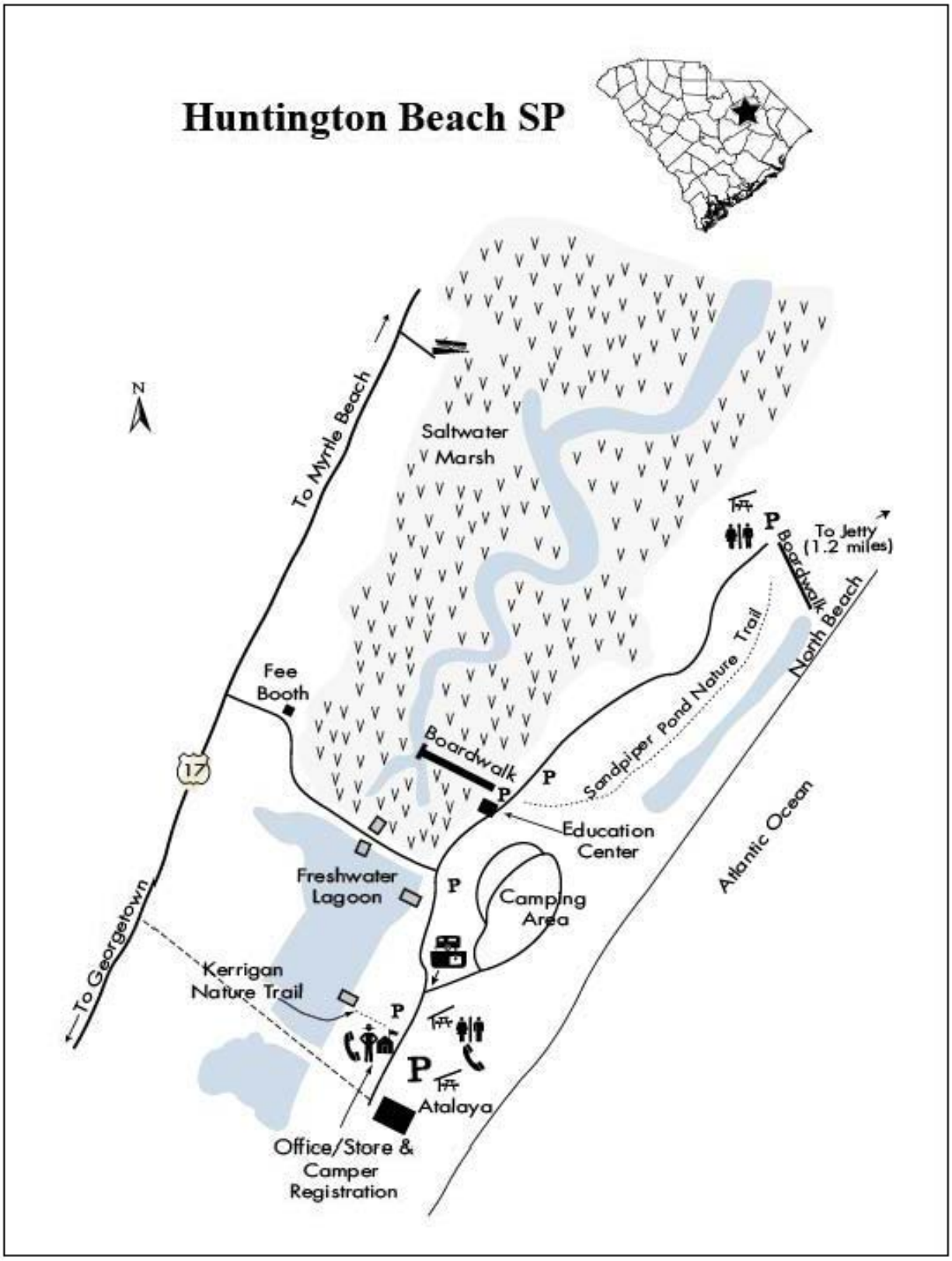
S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Huntington Beach SP
N
To Myrtle Beach
Saltwater Marsh
To Jetty (1.2 miles)
Boardwalk
North Beach
Fee Booth
Sandpiper Pond Nature Trail
17
Boardwalk
P
Education Center
Atlantic Ocean
Freshwater Lagoon
Camping Area
To Georgetown
Kerrigan Nature Trail
Atalaya
Office/Store & Camper Registration

35. Kings Mountain State Park - Crawford Lake (York County)

Problem plant species

Slender naiad

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Aquathol K

Area to which control is to be applied

4 acres in swimming and paddle boat area

Rate of control agent to be applied

Four (4) gallons per acre.

Method of application of control agent

Apply subsurface throughout lake

Timing and sequence of control application

Apply in May or June when naiad growth is initiated.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

Estimated cost of control operations

$1,046

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

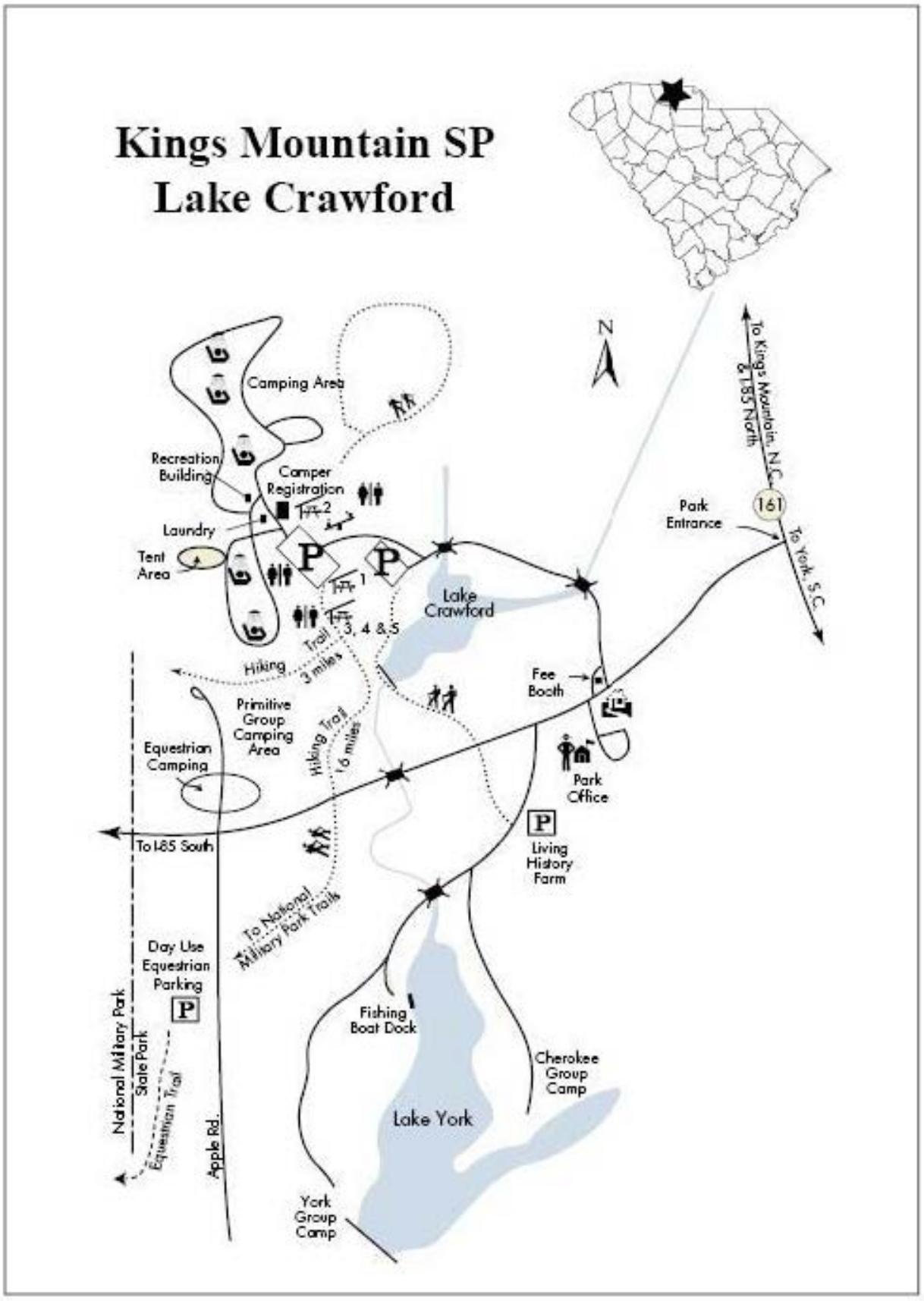
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


Kings Mountain SP
Lake Crawford
N
Camping Area
Recreation Building
Camper Registration
Laundry
Tent Area
Trail 3, 4 &5
Hiking Trail 3 miles
Hiking Trail 1.6 miles
Primitive Group Camping Area
Equestrian Camping
To I-85 South
To National Military Park Trails
Day Use Equestrian Parking
National Military Park
State Park
Equestrian Trail
Apple Rd.
Lake Crawford
Fee Booth
Park Office
Living History Farm
Park Entrance
To Kings Mountain, N.C. & I-85 North
161
To York, S.C.
Fishing Boat Dock
Cherokee Group Camp
Lake York
York Group Camp

36. Little Pee Dee State Park (Dillon County)

Problem plant species

Spikerush, Spatterdock, Water lily, Watershield,

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Renovate Max G, Clearcast, Glyphosate, Habitat

Area to which control is to be applied

10 acres adjacent to the parks day use area, along the park dam and adjacent to the campground

Rate of control agent to be applied

Renovate Max G - 200 lbs per acre.
Clearcast – 0.500 – 0.750 gallons per acre.
Habitat - 0.500 – 0.750 gallons per acre.
Glyphosate – up to 0.937 gallons per acre.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

Estimated cost of control operations

$1,810

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

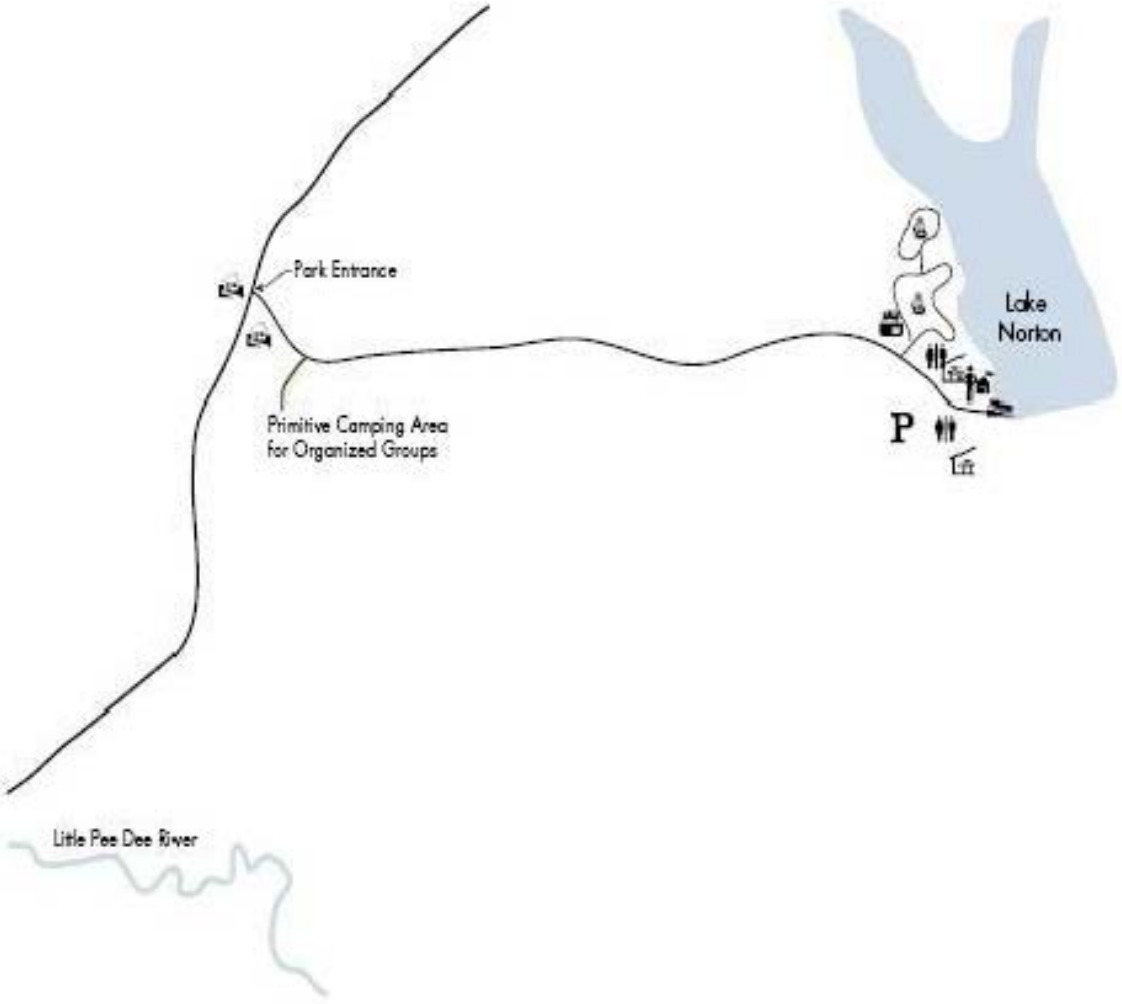
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Little Pee Dee SP
Lake Norton



37. N.R. Goodale State Park (Kershaw County)

Problem plant species

Waterlily, Watershield

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Hardball, Renovate Max G

Area to which control is to be applied

2 acres in lake.

Rate of control agent to be applied

Hardball - Up to 5 gallons per acre.
Renovate Max G – 200 lbs per acre.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

Estimated cost of control operations

$362

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

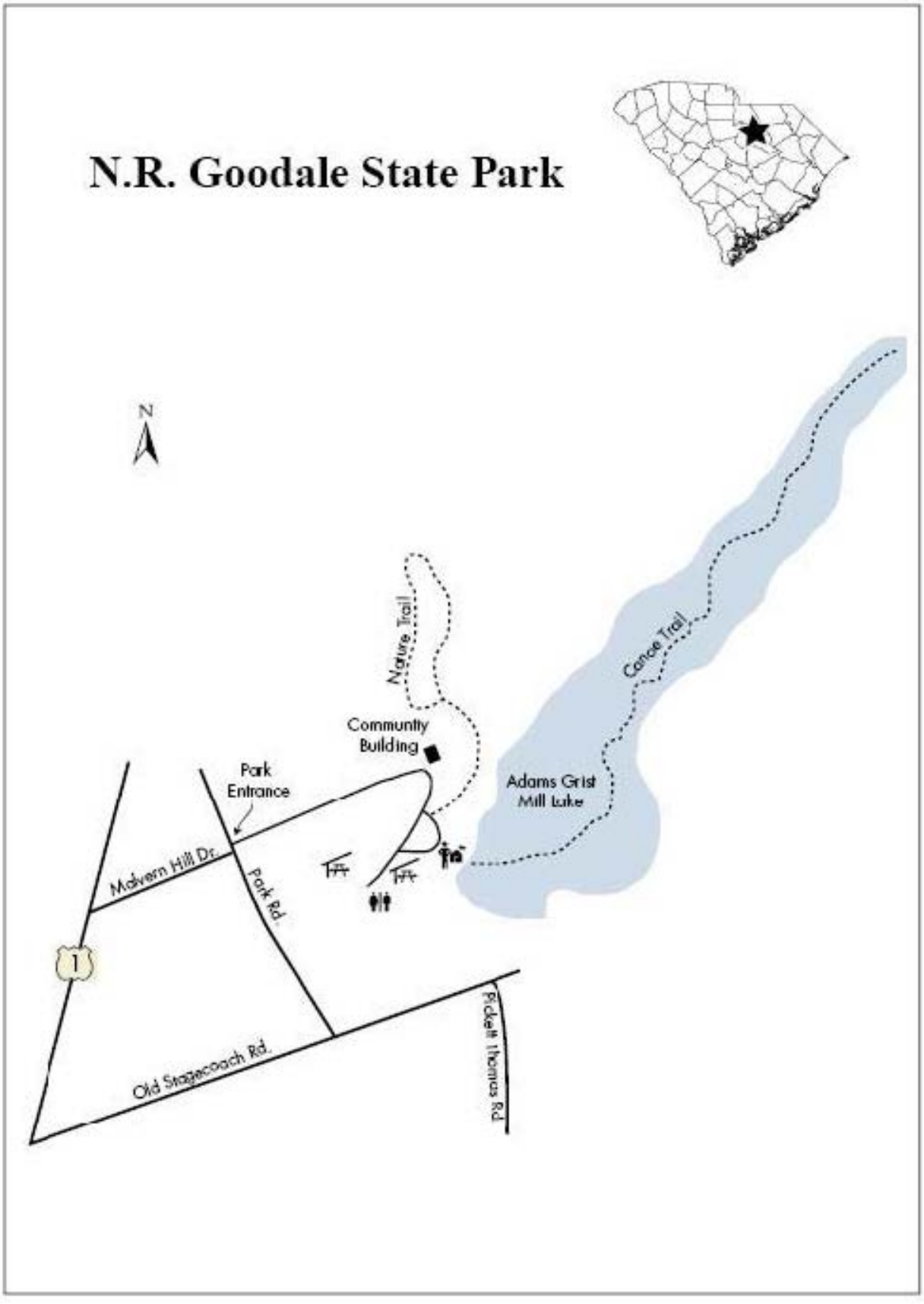
(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.


N.R. Goodale State Park
N
Nature Trail
Canoe Trail
Community Building
Park Entrance
Adams Grist Mill Lake
Malvern Hill Dr.
Park Rd.
1
Old Stagecoach Rd.
Pickett Thomas Rd.

38. Santee State Park - Swimming Lake (Orangeburg County)

Problem plant species

Coontail

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Reward (diquat)

Area to which control is to be applied

10 acres

Rate of control agent to be applied

Reward - 2 gallons per acre.

Method of application of control agent

Subsurface injection from airboat.

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

Estimated cost of control operations

$1,540

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

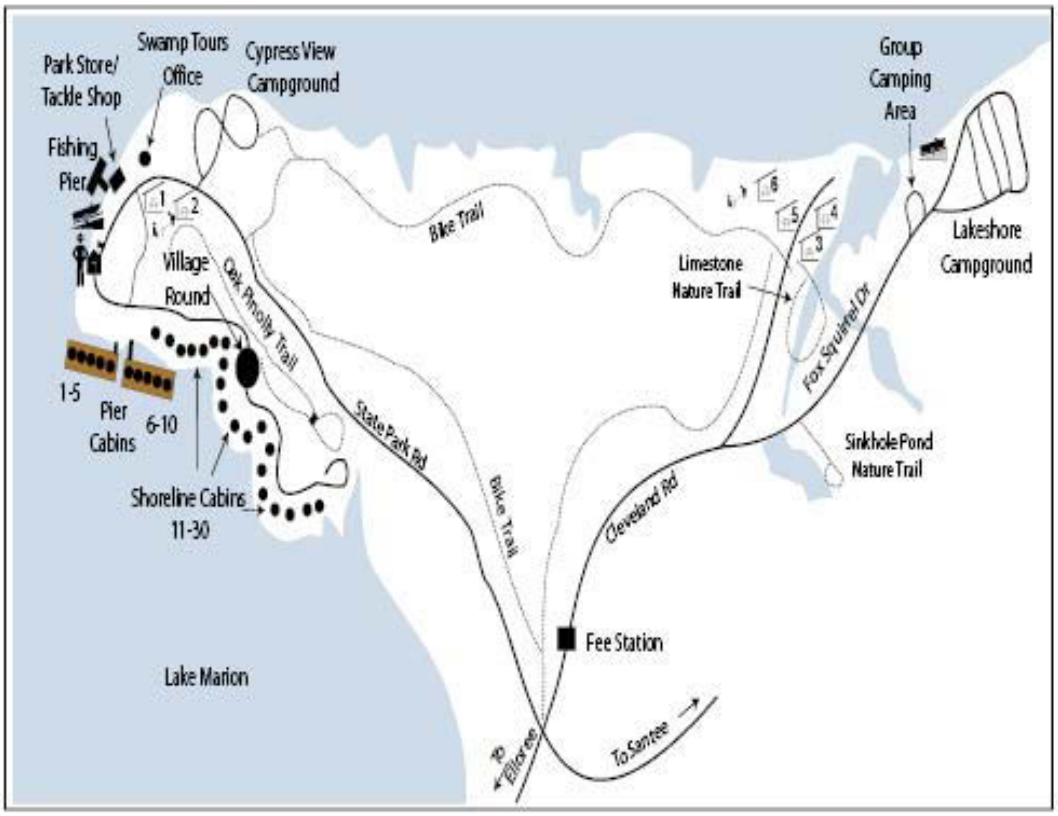
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Santee State Park Swimming Lake



39. Sesquicentennial State Park (Richland County)

Problem plant species

Waterlily, Watershield

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Hardball, Renovate Max G

Area to which control is to be applied

5 acres in swimming and bank fishing portions of the lake.

Rate of control agent to be applied

Hardball - Up to 5 gallons per acre.
Renovate Max G – 200 lbs per acre.

Method of application of control agent

Herbicide - Spray on surface of foliage with appropriate surfactant. Granular broadcast evenly from airboat.

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.

Estimated cost of control operations

$543

Potential sources of funding

S.C. Department of Parks, Recreation and Tourism 50%

S.C. Department of Natural Resources 50% (up to $40,000 cost share per waterbody)

(Percentage of match subject to change based on availability of Federal and State funding.)

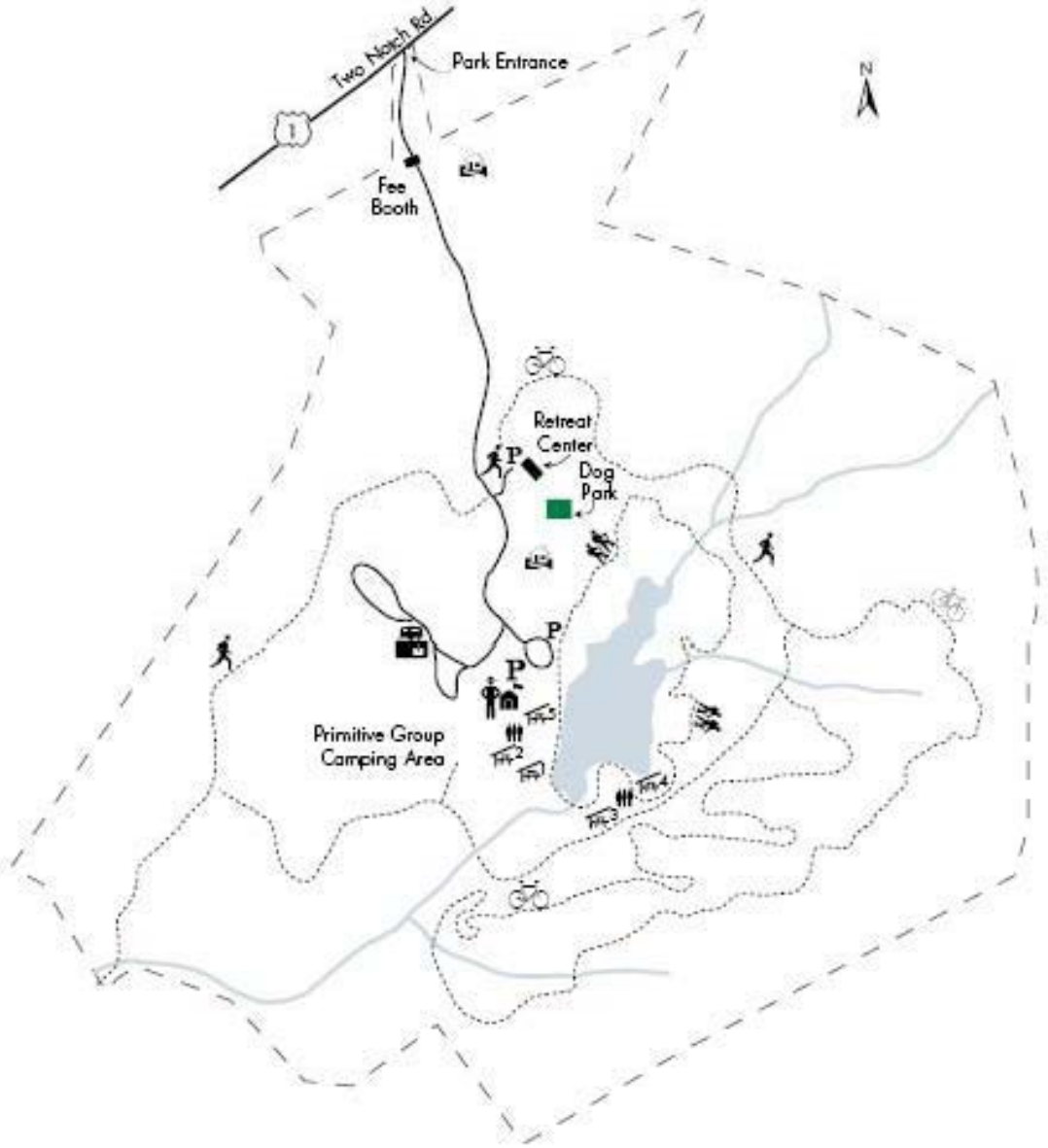
Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Sesquicentennial State Park



South Carolina Department of Natural Resources
State Lakes

*Total price and cost share is for herbicide costs only based on state contract costs. Freshwater Fisheries staff will apply based on label rates.

40. Lake Cherokee (Cherokee County)

Problem plant species

Water primrose

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Renovate 3

Area to which control is to be applied

5 acres in lake, two (2) times per year.

Rate of control agent to be applied

Renovate 3 - 0.500 - 0.750 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

41. Lake Edwin Johnson (Spartanburg County)

Problem plant species

Water primrose, Hydrilla, Pondweed

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Problems species	Control Agent
Water Primrose	Renovate 3
Pondweed	Komeen/Reward
Hydrilla	Komeen/Reward

Area to which control is to be applied

Primrose - 7 acres in lake two (2) times per year.

Hydrilla/Pondweed - 3 acres in lake two (2) times per year.

Rate of control agent to be applied

Renovate 3 - 0.500 - 0 gallons per acre.

Komeen/Reward - 4 gallons per acre / 2 gallons per acre.

Method of application of control agent

Hydrilla, Pondweed -Apply subsurface throughout lake

Water primrose - Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

42. Jonesville Reservoir (Union County)

Problem plant species

Water primrose, Pondweed

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Renovate 3, Glyphosate

Area to which control is to be applied

10 acres in lake.

Rate of control agent to be applied

Renovate 3 - 0.500 – 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

43. Mountain Lakes (Chester County)

Problem plant species

Water primrose, Alligatorweed, Parrotfeather

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Renovate 3, Glyphosate

Area to which control is to be applied

5 acres in lake.

Rate of control agent to be applied

Renovate 3 - 0.500 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

44. Lancaster Reservoir (Lancaster County)

Problem plant species

Water primrose, Alligatorweed

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Renovate 3, Glyphosate

Area to which control is to be applied

8 acres in lake.

Rate of control agent to be applied

Renovate 3 - 0.500 - 0.750 gallons per acre.

Glyphosate - up to 0.937 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

45. Sunrise Lake (Lancaster County)

Problem plant species

Pondweed

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Glyphosate

Area to which control is to be applied

15 acres in lake.

Rate of control agent to be applied

Glyphosate - up to 0.937 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

46. Lake Ashwood (Lee County)

Problem plant species

Waterlily

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

2,4-d BEE granular

Area to which control is to be applied

<5 acres of spotty coverage

Rate of control agent to be applied

200 pounds per acre

Method of application of control agent

Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

47. Lake Edgar Brown (Barnwell County)

Problem plant species

Water primrose, Coontail

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Glyphosate

Area to which control is to be applied

60 acres in lake.

Rate of control agent to be applied

Glyphosate - up to 0.937 gallons per acre.

Method of application of control agent

Spray on surface of foliage with appropriate surfactant

Timing and sequence of control application

Apply when plants are actively growing.

Other control application specifications

Monitor plant growth prior to treatment.

Entity to apply control agent

SCDNR-Wildlife and Freshwater Fisheries Division, Lake Management staff.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

48. Lake George Warren (Hampton County)

Problem plant species

Water primrose, Cattails, Coontail, Naiad

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Glyphosate, Habitat, Triploid Grass Carp

Area to which control is to be applied

20 acres in lake.

Rate of control agent to be applied

Glyphosate - up to 0.937 gallons per acre.

Habitat - 0.250 - 0.500 gals/ac

If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest problematic growth and use herbicide applications to provide immediate short-term control of localized growth in those areas. 500 Triploid Carp

Method of application of control agent

Spray on surface of foliage with appropriate surfactant. Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Timing and sequence of control application

Apply when plants are actively growing.
Triploid grass carp – If conditions warrant, triploid grass carp to be released as soon as possible.

Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

Entity to apply control agent

Herbicide application – SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or commercial applicator.

Triploid Grass Carp - SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or a commercial supplier with supervision by the SCDNR.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

49. Lake Thicketty (Cherokee County)

Problem plant species

Hydrilla

Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.

Selected control method

Hydrilla Triploid grass carp, chelated copper

Area to which control is to be applied

5 acres in lake.

Rate of control agent to be applied

Approximately 5 acres in priority areas such as, public access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas. If conditions warrant, release triploid grass carp in close proximity to areas of the lake with the greatest hydrilla growth and use herbicide applications to provide immediate short-term control of localized growth in those areas. 20 fish per vegetated acre.

Chelated copper - up to 1 ppm Glyphosate- up to 1 gallon per acre.

Method of application of control agents

Chelated copper- subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Timing and sequence of control application

All herbicides to be applied when plants are actively growing.

Triploid grass carp – If conditions warrant, triploid grass carp to be released as soon as possible.

Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

If available, all sterile grass carp will be a minimum of 12 inches in length. Sterile grass carp shipments will be certified by the SCDNR for sterility and checked for size and condition prior to stocking in the lake.

Entity to apply control agent

Herbicide application – SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or commercial applicator.

Triploid Grass Carp - SCDNR Wildlife and Freshwater Fisheries Division, Lake Management staff and/or a commercial supplier with supervision by the SCDNR.

Estimated cost of control operations

$*

Potential sources of funding

S.C. Department of Natural Resources (WFF division) 100%

U.S. Army Corps of Engineers 0%

S.C. Department of Natural Resources 0%

(Percentage of match subject to change based on availability of Federal and State funding.)

Long term management strategy

a) Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

b) Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

c) Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

South Carolina Border Lakes

Approval for Lake Wylie was accomplished by SCDNR staff in conjunction with staff from North Carolina Natural Resource agencies, Duke Energy staff, and the Lake Wylie Marine Commission.

50. Lake Wylie
(York County, SC; Gaston and Mecklenburg County, NC)

Problem plant species

Hydrilla

Management objective

Reduce hydrilla growth lake-wide and prevent the spread of hydrilla to other systems.

Achieve measurable reduction of hydrilla within two or three years and once hydrilla has been controlled, prevent it from reestablishing.

Control hydrilla by using a low enough density of triploid grass carp that potentially other forms of native vegetation can become established.

Selected control method

Triploid (sterile) grass carp used lake wide for long-term control.

Registered and properly applied herbicides should be used for initial suppression and by home owners for spot treatments.

Area to which control is to be applied

Triploid grass carp will be released from boat ramps near the greatest concentration of hydrilla.

Rate of control agent to be applied

Recommendation for supplemental grass carp stocking in the spring of 2011. Because of the loss of sterile grass carp to mortality (disease, predation, fishing, bow hunting, etc.) we recommend 576 grass carp, be stocked in the lake during the spring of 2011. This is a supplemental stocking of 32% (average of national grass carp annual mortality curves, Phil Kirk pers com) of the original 1800 grass carp introduced in 2009. Duke Energy will continue to monitor the effectiveness of the introduced fish.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Method of application of control agents

Herbicide- subsurface application by airboat.

Triploid grass carp – Using standard techniques to minimize loss, stock sterile grass carp in areas of the lake with the greatest hydrilla growth.

Timing and sequence of control application

Herbicide applications - To be applied when plants are actively growing.

Triploid grass carp to be released as soon as possible in the spring of 2011 (March-May) and yearly at the same time for at least the next three years. RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS. After hydrilla has been controlled, follow up stocking, currently estimated at maintaining triploid grass carp stocking densities of approximately 1 fish per every 8 surface acres of Lake Wylie will be continued using mortality estimates derived from the population and population models.

Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Triploid grass carp will be a minimum of 12 inches total length. All shipments will be examined for condition and length specified in the contract with the vendor.

Estimated cost of control operations

All work to be done in North Carolina Section of the lake.

Entity to apply control agent

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

Potential sources of funding

Duke Power Company 100% - All control work at present time is in North Carolina.

Long term management strategy

a) Manage hydrilla's potential adverse impacts to the Lake Wylie ecosystem using primarily triploid grass carp after initial suppression using approved herbicides.

b) Maintain or enhance native aquatic vegetation by maintaining the lowest possible stocking rates of triploid grass carp, especially once major stands of hydrilla have been controlled.

c) Seek to prevent further introduction and distribution of problem aquatic species through public education and enforcement of existing laws and regulations.

d) Periodically revise management plans and strategy as new environmental data becomes available.

e) Plan for long-term control of hydrilla, once control has been achieved, by maintaining very low densities of triploid grass carp. Stockings will be determined from mortality estimates generated from triploid grass carp collected on Lake Wylie and the use of age-structure population models developed for fisheries.

Additional Control Activities

Control efforts for Island Applesnails**,** which costs are shouldered by SCDNR**,** will be conducted in Horry County **and Charleston County**. Herbicides based on the active ingredient Copper will be utilized. Product names include Natrix, Captain, and copper sulfate. Rates will be based on the lowest possible label rates published by the manufacturer.

Problem species

Island Applesnail

Management objective

Achieve measurable reduction of Island Applesnails within two or three years and once controlled, prevent them from reestablishing.

Selected control method

Registered and properly applied herbicides should be used for initial suppression and for spot treatments.

Area to which control is to be applied

Local ponds in Horry County near Socastee and in Charleston County near Mount Pleasant

Rate of control agent to be applied
Herbicide will be applied at the low end of the label rate.

Method of application of control agents

Herbicide- application by hand held sprayers of small boats.

Timing and sequence of control application

Herbicide applications - To be applied when snails are actively growing.

Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Estimated cost of control operations

Costs may vary significantly

Entity to apply control agent

Herbicide application - Commercial applicator or SCDNR

Potential sources of funding

SCDNR 100%

Long term management strategy

a) Manage Island Applesnail's potential adverse impacts to the local ecosystem using approved herbicides. Prevent IAS from expanding its range into adjacent Waccamaw National Wildlife Refuge

b) Seek to prevent further introduction and distribution of problem aquatic species through public education and enforcement of existing laws and regulations.

c) Periodically revise management plans and strategy as new environmental data becomes available.

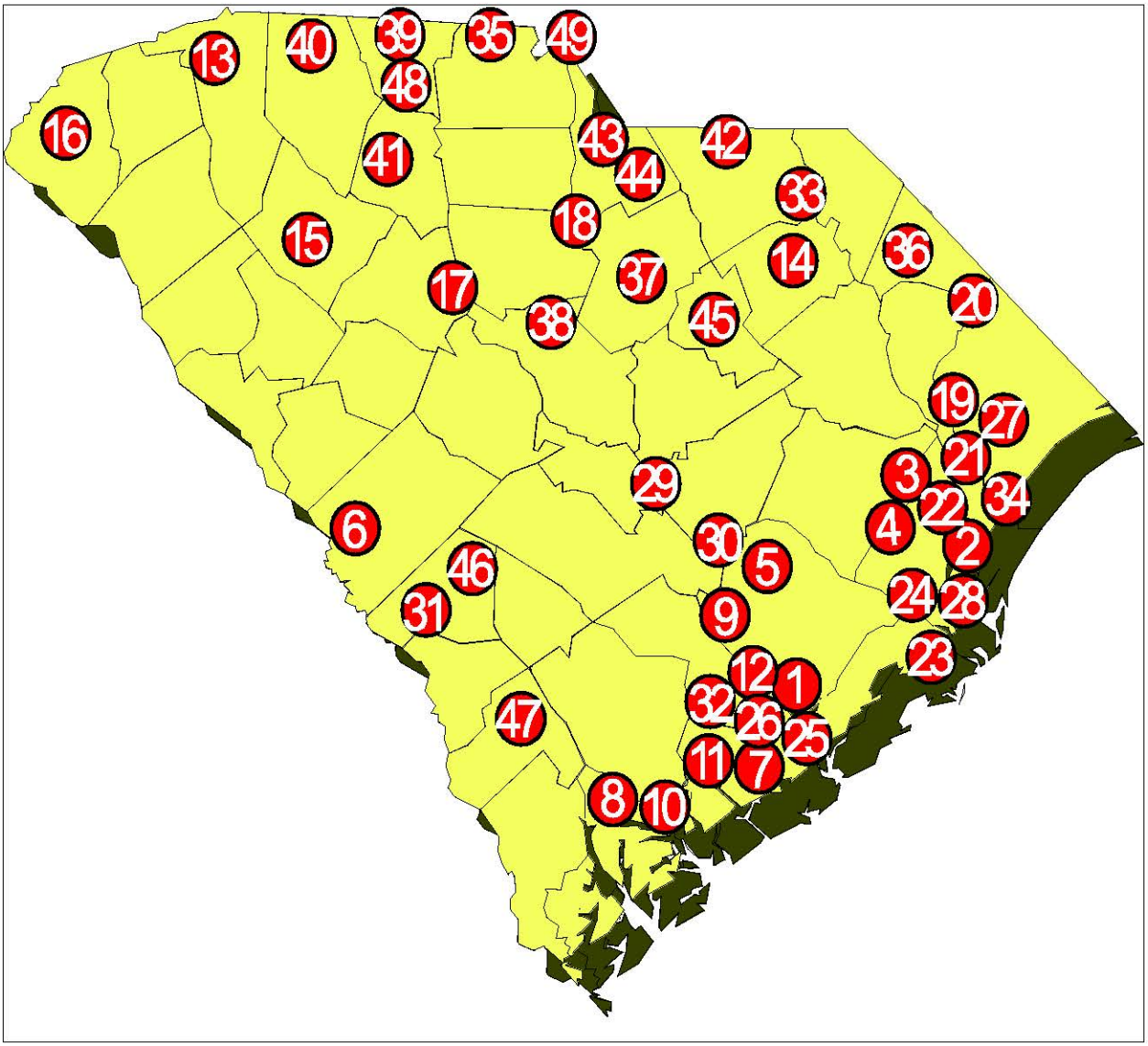
Summary of Planned Management Operation Expenditures For 2011
NOTE: This table needs revision based on new price schedule which is not yet available

	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	Back River Reservoir	$52,082	$26,041	$26,041	$0	SCE&G, CPW
2	Baruch	$6,080	$3,040	$3,040	$0	Baruch
3	Black Mingo Creek	$865	$433	$433	$0	Georgetown Co.
4	Black River	$1,220	$610	$610	$0	Georgetown Co.
5	Bonneau Ferry WMA	$5,691	$2,846	$2,846	$0	SCDNR
6	Boyd Pond	$4,961	$2,481	$2,481	$0	Aiken County
7	Caw Caw Park	$2,011	$1,006	$1,006	$0	Charleston Parks
8	Combahee River	$710	$355	$355	$0	Colleton Co.
9	Cooper River	$34,972	$17,486	$17,486	$0	Berkeley Co.
10	Donnelley/ACE Basin	$2,858	$1,429	$1,429	$0	SCDNR,USF&W
11	Dungannon WMA	$1,032	$516	$516	$0	SCDNR, USF&W
12	Goose Creek Reservoir	$34,943	$17,472	$17,472	$0	CPW
13	Lake Cunningham	$3,293	$1,647	$1,647	$0	Greer CPW
14	Lake Darpo	$3,558	$1,779	$1,779	$0	Darlington Co.
15	Lake Greenwood	$88,732	$48,732	$40,000	$0	Greenwood Co.
16	Lake Keowee	$0	$0	$0	$0	Duke Energy
17	Lake Murray	$0	$0	$0	$0	SCE&G, Lexington Co.
18	Lake Wateree	$0	$0	$0	$0	Duke Energy
19	Little Pee Dee River	$1,775	$888	$888	$0	Horry Co.
20	Lumber River	$636	$318	$318	$0	Horry Co.
21	Pee Dee River	$7,402	$3,701	$3,701	$0	Georgetown Co.
22	Samworth WMA	$5,514	$2,757	$2,757	$0	SCDNR
23	Santee Coastal Reserve	$26,610	$13,305	$13,305	$0	SCDNR
24	Santee Delta WMA	$1,064	$532	$532	$0	SCDNR
25	USACOE AICWW/Chas. Harbor	$21,288	$0	$0	$21,288	USACOE
26	US Naval Weapons Sta.	$5,322	$0	$0	$5,322	US Navy
27	Waccamaw River	$4,038	$2,019	$2,019	$0	USF&W/Horry Co.
28	Yawkey Wildlife Center	$2,661	$1,331	$1,331	$0	SCDNR
	Santee Cooper Lakes					
29	Lake Marion	$650,000	$650,000	$0		Santee Cooper
30	Lake Moultrie	$175,000	$175,000	$0		Santee Cooper
	State Parks					

31	**Barnwell SP**	**$543**	**$272**	**$272**	**$0**	**SCPRT**
32	**Charlestown Landing SP**	**$1,070**	**$535**	**$535**	**$0**	**SCPRT**
33	**H Cooper Black SP**	**$362**	**$181**	**$181**	**$0**	**SCPRT**
34	**Huntington Beach SP**	**$1,162**	**$581**	**$581**	**$0**	**SCPRT**
35	**Kings Mountain SP**	**$1,046**	**$523**	**$523**	**$0**	**SCPRT**
36	**Little Pee Dee SP**	**$1,810**	**$905**	**$905**	**$0**	**SCPRT**
37	**NR Goodale**	**$362**	**$181**	**$181**	**$0**	**SCPRT**
38	**Santee**	**$1,540**	**$770**	**$770**	**$0**	**SCPRT**
39	**Sesquicentennial SP**	**$543**	**$272**	**$272**	**$0**	**SCPRT**
	SCDNR Total	**$319,318**	**$150,720**	**$141,988**	**$26,610**	
	State Park Lake Total	**$8,438**	**$4,219**	**$4,219**	**$0**	
	Santee Cooper Total	**$825,000**	**$825,000**	**$0**	**$0**	
	Grand Total	**$1,152,756**	**$979,939**	**$146,207**	**$26,610**	

NOTE: Planned expenditures are based on anticipated aquatic plant problems. The extent of proposed management operations will be modified depending on actual aquatic plant growth and funding availability in 2011 (Percentage of match subject to change based on availability of Federal and State funding.) * Control operations on Lakes Marion and Moultrie may receive federal funds from the Corps of Engineers St. Stephen Plant if control activities are directly related to maintaining operation of the St. Stephen Hydropower Facility. Those funds should be used whenever possible instead of APC cost-share funds from the Charleston District.

Location of 2011 Management Sites



Appendices

APPENDIX A

Major River Basins in South Carolina


South Carolina's Water Resources
Charlotte
North Carolina
Greenville
Spartanburg
Florence
Columbia
Myrtle Beach
Augusta
Georgia
Charleston
Atlantic Ocean
Hilton Head
Savannah
Legend
River Basins
ACE
Santee
Pee Dee
Savannah
Lakes and Rivers
0 15 30 60
Miles
N
W
E
S

APPENDIX B
Additional Documentation for NPDES General Permit

Personnel, Contractors, Emergency Numbers

3) Aquatic Nuisance Species Program Emergency Numbers

SCDNR Main Street Office	803-734-4036	Radio Room – Law Enforcement	803-955-4000
SCDNR Emergency Number	800-922-5431	DHEC Local Number – Columbia	803-253-6488
Poison Control Hotline	800-222-1222	National Response Center	800-424-8802
Chemical Spill/Fish Kill Emergency Number (DHEC)		888-481-0125	
Clemson Department of Pesticide Regulation		864-646-2150	
Chris Page Program Manager Aquatic Nuisance Species Program SC Department of Natural Resources 2730 Fish Hatchery Road West Columbia, SC 29170 803-755-2836 Voice 803-600-7541 Cell		Michael Hook Field Supervisor Aquatic Nuisance Species Program SC Department of Natural Resources 2730 Fish Hatchery Road West Columbia, SC 29170 803-755-2872 Voice 803-667-1249 Cell	
Walter Meitzen Aquatic Plant Management Technician Habitat Coordinator Aquatic Nuisance Species Program SC Department of Natural Resources 2730 Fish Hatchery Road West Columbia, SC 29170 No Office Phone Voice 803-360-0692 Cell		Bob Cernuda Vice President-Southeast Division PLM Lake and Land Management Corp. 46 Veronica Road Georgetown, SC 29440 866 PRO-LAKE Toll Free-866 776-5253 843 545-1114 Voice 866 899-1627 Toll Free Fax 843 458-3022 Cell	

DNR Region	Counties	Land, Water & Conservation	Freshwater Fisheries Fish Kills	Wildlife Wildlife Problems	Law Enforcement	Marine Resources	Support Services
Region I (Clemson) 311 Natural Resources Drive Clemson, SC 29631 (864) 654-1671	Abbeville Anderson Cherokee Edgefield Greenville Greenwood Laurens McCormick Oconee Pickens Spartanburg Union	Lee Mitchell 864-654-1671 ext 37 864-979-0520 (Cell)	Dan Rankin 864-654-1671 Ext. 12 864-982-2175 (Cell)	Tom Swayngham 864-654-1671 Ext. 21 864-982-2921 (Cell)	CPT Mark Carey 864-654-1671 Ext 17 803-260-6713 (Cell)	None Assigned	Don Winslow 803-734-3672 (Main Columbia Office) Greg Lucas 864-654-1671 Ext 22 864-380-5201 (Cell)

Region II (Florence) 2007 Pisgah Rd Florence, SC 29501 (843) 661-4766	Chester Chesterfield Darlington Dillon Fairfield Florence Lancaster Kershaw Lee Marion Marlboro Williamsburg York		Elizabeth Osier 843-870-5839 843-870-0624 (Cell)	Sam Stokes 843-870-3771 (Cell)	CPT William Poole 843-616-4766 (Cell)	None Assigned	Scott Speares 803-734-3624 (Main Columbia Office)
Region III (Columbia) PO Box 167 1000 Assembly St. Columbia, SC 29202 (803) 734-4303	Aiken Allendale Bamberg Barnwell Calhoun Clarendon Lexington Newberry Orangeburg Richland Saluda Sumter	Marc Cribb 803-734-6367 803-331-1568 (Cell)	Hal Beard 803-955-0462 803-609-7024 (Cell)	Brett Moule 803-734-3940 803-609-6988 (Cell)	CPT Harvin Brock 803-734-4012 803-260-6716 (Cell)	None Assigned	DeAnne Gray 803-734-3902 (Main Columbia Office) Richard Byrd 803-734-3998 (Main Columbia Office) 803-360-0252 (cell)
Region IV (Charleston) PO Box 12559 217 Ft. Johnson Rd. Charleston, SC 29412 (843) 953-9307	Beaufort Berkeley Charleston Colleton Dorchester Georgetown Hampton Horry Jasper		Scott Lamprecht 843-953-5160 843-870-5810 (Cell)	Sam Chappelear 843-953-5291 843-870-5777 (Cell)	CPT Chisolm Frampton 843-953-9307 843-870-5554 (Cell)	David Whitaker 843-953-9392 843-442-2093 (Cell)	

4) Pest Management Area Description
   (See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)
5) Control Measure Description
   (See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)
6) Schedules and Procedures
   (See AQUATIC PLANT MANAGEMENT STRATEGY section for Specific Water body.)
7) PESTICIDE SPILL POLICY AND PROCEDURES
   a. Put on protective clothing as may be appropriate: rubber boots, aprons, gloves, mask, and respirator. Use special caution if two different materials are spilled and mix together. They may react chemically to form noxious fumes.
   b. Immediately contain the spill. Use absorbents, dikes, mops or brooms, dirt or sand to retard the spread of the spill.
   c. Notify your Contacts listed above or person in charge.
   d. Recover the spill into containers (usually 5 gallon buckets or 30 gallon drums). Each warehouse should have at least one clean, empty 30-gallon drum for the purpose.
   e. After sealing each recovered material container, mark it or attach a tag clearly to identify its contents, approximate quantity and date.
   f. Move containers of spilled materials to a secure area.
   g. Prepare a spill report giving relevant information including date; location; material spilled; approximate quantity; actions taken; location of recovered material; cause or circumstances leading to spill; and recommendations on how to avoid this problem in the future.

h. Contact the office for disposal instructions. **DO NOT USE OR DISPOSE OF SPILLED MATERIALS WITHOUT PRIOR REVIEW.**

i. Depending on the circumstances, the best disposal method will differ. Some potential alternatives are:

1. Use in the normal course of business;
2. Dilute and wash into sanitary sewer;
3. Shipment to an approved hazardous waste facility; neutralization / detoxification on site.
4. Since a decision on how best to dispose of a spill may be quite complex, we may want input from manufacturers, regulatory officials or technical advisors. Consult the office before acting.

8) SPILL RESPONSE

Purpose: To ensure the safety of all individuals participating in or affected by herbicide use, to minimize the SCDNR's and Contractor's exposure to liability, to ensure the appropriate and effective application of herbicides as a management tool, and to minimize detrimental effects to the environment.

The following information will provided following the discovery and initial telephonic reporting of the spill:	
1.	Time spill occurred or was first observed: _____
2.	Name of person first observing spill: _____
3.	Location of initial spill and present location if moving: _____
4.	Type of spilled material: _____
5.	Estimate of amount spilled or rate of release if continuing: _____
6.	Environmental conditions e.g., wind direction and speed, wave action, and currents: _____

7.	If from mobile container (e.g., 2.5, 5, 15, 30, 55, tote): _____
8.	Description of area likely to be affected by spill --e.g., riverbanks, lakes, land areas, wildlife areas: _____
9.	Cause of spill, if determined: _____
10.	Action taken to combat spill, if any: _____
11.	Activities or authorities notified: _____ _____ _____

SPILL KIT CONTENTS

A spill kit is required to be assembled and placed in locations where pesticides are mixed, and on vehicles, which transport pesticides.

Shop Kit Quantity	Vehicle Kit Quantity	Item
1 (55 gal)	1 (5 gal)	open-head drum
1	1	pesticide spill policy and procedures
4	2	pairs of nitrile gloves
2	1	pairs of unvented goggles
2	1	respirator and pesticide cartridges
2	1	aprons (chemical resistant)
2	1	pairs of rubber boots
2	1	pairs of tyvek coveralls

1	1	dustpan
1	1	shop brush
12	6	heavy ply, polyethylene bags w/ties
1	1	first aid kit
80	10	lbs absorbent material
1	1	dozen blank labels
0	1	portable eyewash
1	0	synthetic fiber push broom
1	0	square-point "D" handle shovel

Required practices, described below, are designed to ensure that the SCDNR's standards for use of herbicides meet or exceed the U.S. EPA's Worker Protection Standard for Agricultural Pesticides.

a. Prior to implementing use of any herbicide, the need for its use relative to management goals shall be described in the S.C. Aquatic Plant Management Plan, and/or in a Weed Plan specific to the site.
b. Only employees or contractors, who are certified/licensed by state and/or local regulations, are authorized to apply herbicides.
c. Application techniques, monitoring strategies, and impacts/progress toward goals and required reporting information shall be documented.
d. Standard safety practices for storage, mixing, transportation, disposal of containers and unused herbicide, and spill management will be followed.
e. Herbicide containers and related equipment will be stored in a secure containment area away from people, animals and food. Herbicide containers will be stored closed and inspected periodically. Hazardous waste will be labeled appropriately and include accumulation start dates.
f. Additional training required for the proper use and maintenance of personal protective equipment (PPE) and other equipment or required by the Occupational Safety and Health Administration (OSHA) shall be coordinated.
g. The point(s) of contact and threshold size for spills that must be reported shall be verified in advance with the appropriate local agency. This information and other emergency related information shall be provided to all applicators and initial responders through a written contingency plan.
h. Directions and contact numbers of the nearest emergency medical treatment facility will be provided to all applicators.
i. Investigations of herbicide related accidents and receipt of employee suggestions or complaints relating to safety and health issues involving herbicides will be used as a feedback mechanism that can be used to improve the program.
j. Decontamination kits must be readily available, and must include two one-gallon (or more) containers filled with potable water, eyewash kits or eyewash bottles with

buffered isotonic eyewash, hand or body soap, paper or other disposable towels, a full Tyvek coverall with foot covers, and a map and directions to the nearest medical facility. Whenever possible, those who apply herbicides shall have access (within 15 minutes travel time or at the nearest vehicle access point, whichever is closest) to an eyewash kit and either a 1) shower or large sink, or 2) emergency decontamination and first aid kits.

k. Treated areas should be closed to public access until they are judged safe for re-entry (or until the herbicide dries or for the minimum period required by the product label, whichever is longer). Posting is not required in most places, but where it is required (usually by local statute), place notices at points of entry or the perimeter of treated areas. Posting notices should include a statement that the area has been or will be treated, name of the herbicide, date of treatment, appropriate precautions to be taken or the date when re-entry is judged to be safe, and a phone number for additional information. Notices should be removed after it is judged safe to re-enter the area.
l. Under the NPDES Permit requirements, the SCDNR is required to maintain records for all herbicide application activities. These records shall include information on site(s), purpose(s), name(s) and amount(s) of product(s) used, name(s) of applicator(s), and licensing requirements for all herbicide applications in the previous 12 months. In addition, a yearly report shall include the same information, with estimates for the upcoming 12 months.

9) Adverse Incident Response

Any incident which results in adverse impacts to fish, wildlife, or non target plant species will be reported to the appropriate contacts as listed in the Section 1 contacts table. Additionally, the causes of the adverse impact will be determined through a scientific assessment to prevent or mitigate future problems.

10) Pesticide Monitoring Requirements
    a. While there are no specific pesticide residue monitoring requirements the SCDNR will maintain the following information along with any required monitoring data:
    b. Records of equipment maintenance and calibration are to be maintained only by the entity performing the pest application activity (on behalf of self or client).
    c. A copy of the NOI submitted to the Department and any correspondence exchanged between you and the Department specific to coverage under this permit;
    d. The date on which you knew or reasonably should have known that you would exceed an annual treatment area threshold during any calendar year, as identified in Part 1.2.2;
    e. Surveillance method(s) used, date(s) of surveillance activities, and findings of surveillance;
    f. Target pest(s);
    g. Pest density prior to pesticide application;
    h. Company name and contact information for pesticide applicator;
    i. Pesticide application date(s);
    j. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters, either by name or by location, to which

you discharged any pesticide(s)(a GIS record of the specific area where discharge of herbicide occurs);

k. Name of each pesticide product used including the EPA registration number;
l. Quantity of pesticide applied (and specify if quantities are for the pesticide product as packaged or as formulated and applied);
m. Concentration (%) of active ingredient in formulation;
n. For pesticide applications directly to waters, the effective concentration of active ingredient required for control;
o. Any unusual or unexpected effects identified to non-target organisms;
p. Documentation of any equipment cleaning, calibration, and repair (to be kept by pesticide application equipment operator); and
q. A copy of your PDMP, including any modifications made to the PDMP during the term of this permit.

11) General Specifications

a. The Contractor and SCDNR shall utilize equipment specifically designed for commercial application of herbicides. Equipment shall be kept in good operating condition at all times and must meet or exceed all safety requirements for this type of work. The equipment must be calibrated to disperse herbicides at the prescribed rate as outlined in the plan and records of said calibration shall be maintained. As a minimum requirement, the equipment shall meet the following conditions:
b. The Contractor shall have a minimum of two watercraft (airboats) and a skiff with a "mudmotor" capable of traveling through heavily vegetated waterways. The watercraft shall be equipped with depth finders capable of locating vegetation underwater, such as an Eagle Ultra or equivalent make and model. The Contractor shall also have a computerized herbicide delivery spray system which is calibrated and has Global Positioning System capability on each watercraft capable of recording exact positions of all treatments. Such unit shall be capable of creating a file, such as a shape file, which will be capable of being imported into a Geographic Information System program such as ESRI's ArcView or any ArcInfo based software and will provide SCDNR with a copy of such file in a timely manner. All data will become the property of SCDNR. The watercraft shall be capable of operation by one or two persons and shall be set up for underwater injection, handgun application, or granular broadcast application. A helicopter contract or access must also be available to the Contractor for performing aerial application of herbicides as needed at specified sites when needed.
c. SCDNR reserves the right to inspect and approve all equipment to be utilized prior to the award. Non-conformance of equipment to SCDNR standards shall be reason for rejection of daily work.
d. Regulations and Standards:
e. The work shall comply with all laws, ordinances, and regulations of all legally constituted authorities that have jurisdiction over any part of this work. These requirements supplement these specifications and shall take precedence in case of conflict.

f. All work shall be performed and completed in a thoroughly workman like manner in accordance with best modern practices and any permit requirements, regardless of any omissions from the attached specifications and/or drawings.

12) QUALIFICATIONS

a. The Contractor must have a minimum of five years of professional experience in the area of chemical aquatic weed control on large public waterbodies.
b. All persons applying chemicals must be certified by the Clemson University Department of Pesticide Regulation in Category 5 (Aquatic Pest Control) or must work under the direct supervision of a person so tested and present on the spray boat.
c. All persons applying chemicals must be capable of identifying target plants in the field.
d. The Contractor must maintain liability insurance coverage of at least Five Million Dollars ($5,000,000) to fulfill requirements of PART II.A.12.

APPENDIX C

Enabling Legislation

South Carolina Code of Laws Section 49-6-10/40

Title 49 – Waters, Water Resources and Drainage

CHAPTER AQUATIC PLANT MANAGEMENT

SECTION 49-6- Purpose; administering agency.
There is hereby created the South Carolina Aquatic Plant Management Program for the purpose of preventing, identifying, investigating, managing, and monitoring aquatic plant problems in public waters of South Carolina The program will coordinate the receipt and distribution of available federal, state, and local funds for aquatic plant management activities and research in public waters.

The Department of Natural Resources (department) is designated as the state agency to administer the Aquatic Plant Management Program and to apply for and receive grants and loans from the federal government or such other public and private sources as may be available for the Aquatic Plant Management Program and to coordinate the expenditure of such funds.

SECTION 49-6-20. Aquatic Plant Management Trust Fund.
There is created the South Carolina Aquatic Plant Management Trust Fund which must be kept separate from other funds of the State. The fund must be administered by the department for the purpose of receiving and expending funds for the prevention, management, and research of aquatic plant problems in public waters of South Carolina Unexpended balances, including interest derived from the fund, must be carried forward each year and used for the purposes specified above. The fund shall be subject to annual audit by the Office of the State Auditor.

The fund is eligible to receive appropriations of state general funds, federal funds, local government funds, and funds from private entities including donations, grants, loans, gifts, bond issues, receipts, securities, and other monetary instruments of value. All reimbursements for monies expended from this fund must be deposited in this fund.

SECTION 49-6-30. Aquatic Plant Management Council; membership; duties.
There is hereby established the South Carolina Aquatic Plant Management Council, hereinafter referred to as the council, which shall be composed of ten members as follows:

The council shall include one representative from each of the following agencies, to be appointed by the chief executive officer of each agency:

(a) Water Resources Division of the Department of Natural Resources;

(b) South Carolina Department of Health and Environmental Control;

(c) Wildlife and Freshwater Fish Division of the Department of Natural Resources;

(d) South Carolina Department of Agriculture;

(e) Coastal Division of the Department of Health and Environmental Control;

(f) South Carolina Public Service Authority;

(g) Land Resources and Conservation Districts Division of the Department of Natural Resources;

(h) South Carolina Department of Parks, Recreation and Tourism;

(i) Clemson University, Department of Fertilizer and Pesticide Control.

The council shall include one representative from the Governor's Office, to be appointed by the Governor.

The representative of the Water Resources Division of the Department of Natural Resources shall serve as chairman of the council and shall be a voting member of the council.

The council shall provide interagency coordination and serve as the principal advisory body to the department on all aspects of aquatic plant management and research. The council shall establish management policies, approve all management plans, and advise the department on research priorities.

SECTION 49-6-40. Aquatic Plant Management Plan.
The department, with advice and assistance from the council, shall develop an Aquatic Plant Management Plan for the State of South Carolina The plan shall describe the procedures for problem site identification and analysis, selection of control methods, operational program development, and implementation of operational strategies. The plan shall also identify problem areas, prescribe management practices, and set management priorities. The plan shall be updated and amended at appropriate intervals as necessary; provided, however, problem site identification and allocation of funding shall be conducted annually. In addition, the department shall establish procedures for public input into the plan and its amendments and priorities. The public review procedures shall be an integral part of the plan development process. When deemed appropriate, the department may seek the advice and counsel of persons and organizations from the private, public, or academic sectors.

The council shall review and approve all plans and amendments. Approval shall consist of a two-thirds vote of the members present. The department shall have final approval authority over those sections which do not receive two-thirds approval of the council.

Some of the Specific State Laws which pertain to Illegal, Noxious, or Nuisance Species:

Title 46, Chapter 9 - State Crop Pest Act
The State Crop Pest Commission is authorized by law (Section 46-9-40) to promulgate and enforce reasonable regulations to eradicate or prevent the introduction, spread or dissemination of plant pests. Plant pests are by definition (Section 46-9-15(5)) any living state of insects, mites, nematodes, slugs, animals, protozoa, snails or other invertebrate animals, bacteria, weeds, fungi, other parasitic plants...which directly or indirectly may injure or cause disease or damage in plants...and which may be a serious agricultural threat to the State, as determined by the Director.

The State Crop Pest Commission is responsible for control of plant pests which constitute a threat to production agriculture. In so doing, the Commission is the primary contact point for cooperation with the Animal and Plant Health Inspection Service (APHIS), U. S. Department of Agriculture.

The Commission has designated certain organisms as plant pests. These organisms are already designated as noxious weeds by state and/or federal authorities or are under domestic federal

quarantine. Once a plant pest has been designated, the Commission has the authority to impose control measures, up to and including, quarantine of the premises. However, the Director, as the Commission's designee, retains the discretion to determine that a plant pest has become so widespread that further control measures are not warranted.

Title 46, Chapter 23 - South Carolina Noxious Weed Act
Provides far reaching powers to seize, quarantine, treat, destroy, apply other remedial measures, to export, return to shipping point, or otherwise dispose of in such a manner as (it) deems appropriate, any noxious weed or any product or article of any character whatsoever or any means of conveyance which (it) has reason to believe contains or is contaminated with any noxious weed, offered for movement, moving, or has moved into or through the state or intrastate. To further deter persons from spreading nuisance aquatic weeds the law includes fines not exceeding $500 and/or imprisonment not exceeding one year.

SECTION 50-13-1415 -Importation, possession, or placing water hyacinth and hydrilla in waters of the state.
No person shall possess, sell, offer for sale, import, bring, or cause to be brought or imported into this State, or release or place into any waters of this State any of the following plants:
(1) Water Hyacinth
(2) Hydrilla
Provided, however, that the department may issue special import permits to qualified persons for research purposes only.
The department shall prescribe the methods, control, and restrictions which are to be adhered to by any person or his agent to whom a special permit under the provisions of this section is issued. The department is authorized to promulgate such regulations as may be necessary to effectuate the provisions of this section and the department, by regulation, is specifically authorized to prohibit additional species of plants from being imported, possessed, or sold in this State when, in the discretion of the department, such species of plants are potentially dangerous.

SECTION 50-13-1630. Importing, possessing or selling certain fish unlawful; special permits for research; Department shall issue rules and regulations.

(A) A person may not possess, sell, offer for sale, import, bring, or cause to be brought or imported into this State or release into the waters of this State the following fish or eggs of the fish:

(1) carnero or candiru catfish (*Vandellia cirrhosa*);
(2) freshwater electric eel (*Electrophorus electricus*);
(3) white amur or grass carp (*Ctenopharyngodon idella*);
(4) walking catfish or a member of the Clariidae family (*Clarias, Heteropneustea, Gymnallabes, Channallabes,* or *Heterobranchus* genera); (5) piranha (all members of *Serrasalmus, Rooseveltiella*, and *Pygocentrus* genera);
(6) stickleback;
(7) Mexican banded tetra;
(8) sea lamprey;

(9) rudd (*Scardinius erythrophtalmu*-Linneaus); and
(10) snakehead (all members of family Channidae).

(B) The department may issue special import permits to qualified persons for research and education only.

(C) (1) The department may issue special permits for the stocking of sterile white amur or grass carp hybrids in the waters of this State. The special permits must certify that the permitee's white amur or grass carp hybrids have been tested and determined to be sterile. The department may charge a fee of one dollar for each white amur or grass carp hybrid that measures five inches or longer or twenty-five cents for each white amur or grass carp hybrid that measures less than five inches. The fee collected for sterility testing must be retained by the department and used to offset the costs of the testing.

(2) The department is authorized to promulgate regulations to establish a fee schedule to replace the fee schedule contained in item (1) of this subsection. Upon these regulations taking effect, the fee schedule contained in item (1) of this subsection no longer applies.

(D) The department may issue special permits for the importation, breeding, and possession of nonsterile white amur or grass carp hybrids. The permits must be issued pursuant to the requirements contained in Chapter 18 of this title. Provided, however, that no white amur or grass carp hybrids imported, bred, or possessed pursuant to a special permit issued pursuant to this section may be stocked in the waters of this State except as provided in subsection (C) of this section.

(E) It is unlawful to take grass carp from waters stocked as permitted by this section. Grass carp caught must be returned to the water from which it was taken immediately.

(F) The department must prescribe the qualifications, methods, controls, and restrictions required of a person or his agent to whom a special permit is issued. The department must condition all permits issued under this section to safeguard public safety and welfare and prevent the introduction into the wild or release of nonnative species of fish or other organisms into the waters of this State. The department may promulgate regulations necessary to effectuate this section and specifically to prohibit additional species of fish from being imported, possessed, or sold in this State when the department determines the species of fish are potentially dangerous.

APPENDIX D

Aquatic Plant Problem Identification Form

Aquatic Plant Problem Site Identification Form

Name and location of affected water body

_____

GPS Location (LAT/LONG or UTM. specify projection)

_____

Public or private water

_____

Name of problem plant (if known)

_____

Does the plant grow above or below the surface of the water?

_____

Approximate area of water covered by the problem plant

_____

Type of water use(s) affected by the plant

_____

Length of time problem has existed

_____

Plant control methods that have been used

_____

Contact for additional information: _____

Name _____

Address _____

Phone _____

Please Return To: Aquatic Nuisance Species Program

S.C. Department of Natural Resources
2730 Fish Hatchery Road
West Columbia, South Carolina 29170
(803) 755-2836 email: invasiveweeds@dnr.sc.gov

** Please include a sample of the plant if possible. Wrap the plant in a moist towel and place in a "baggie". The sample should include flowers, if visible, along with leaf structure and stem.

APPENDIX E

Aquatic Plant Control Agents

Aquatic Plant Control Agents

Listed below are the major aquatic plant control agents which are currently available for use in South Carolina While the list is not all inclusive, it does contain those agents considered most useful for aquatic plant management. Costs for the agents are approximations and will vary somewhat depending on the source and amount purchased. Application costs are approximations of commercial applicator rates.

I. Chemical Control

Diquat (Reward)

Target Plants

Submersed species - Bladderwort, coontail, elodea, naiad, pondweeds, watermilfoil, and hydrilla. Floating species - Pennywort, Salvinia, water hyacinth, water lettuce, and duckweed.

Application Rate

Submersed species - One to two gallons per surface acre. Floating species - One half to one gallon per surface acre, depending on target species.

Cost -Diquat costs approximately $99 per gallon. Assuming an application rate of two gallons per acre and an application cost of $41 per acre, the total cost would be $239 per acre per application for submersed species. The treatment cost for floating species at one-half gallon per acre rate would be $90 per acre.

Use Considerations -Diquat is not toxic to fish or wildlife at normal use concentrations. It is non-volatile and nonflammable, but can cause irritation to eyes and skin upon contact. Its effectiveness is greatly reduced at temperatures below 50-60°F, by overcast conditions, and by turbid waters.

Water Use Restrictions - Water treated with Diquat cannot be used for drinking for up to 3 days, livestock consumption for one day, irrigation of food crops for 5 days, and irrigation of turf and ornamentals for up to 3 days depending on application rate or until approved analysis indicates that diquat ion concentrations are less than 0.02 ppm. There are no fishing or swimming restrictions. Do not apply this product within 1600 feet upstream of an operating water intake in flowing water bodies (rivers, streams, canals) or within 400 feet of an operating water intake in standing water bodies (lakes, reservoirs). To make applications within these restricted areas, the intake must be turned off for the time periods specified on the Federal label for the appropriate use category (Drinking, Livestock consumption, Irrigation) or until the treated area contains less than 0.02 ppm of diquat dibromide.

B.2,4-D (Aqua-Kleen, Navigate, Hardball, Sinkerball)

Target Plants

Emergent species - Broadleaf species such as water primrose, waterlily, cowlily, watershield, smartweed, pondweeds, and floating heart. Submersed species - Watermilfoil, bladderwort, and coontail. Floating species - Water hyacinth.

Application Rate

Granular form (2,4-D BEE) - 150 to 200 pounds per acre depending on target species. Liquid form - (2,4-D DMA) - 5 gallons per acre.

Cost

The granular form of 2,4-D costs about $36 per pound. Assuming an application rate of 200 pounds per acre and an application cost of $47 per acre, the total cost would be $519 per application. The liquid form of 2,4-D costs approximately $31 per gallon. Assuming an application rate of 5 gallons per acre and an application cost of $41 per acre, the total cost would be $196 per application

Use Considerations - The recommended formulations of 2,4-D are not toxic to fish or wildlife at normal use concentrations. This chemical is nonflammable and noncorrosive.

Water use Restrictions - Do not apply to waters used for irrigation, agricultural sprays, watering dairy animals, or domestic water supplies.

Chelated Copper (Cutrine Plus, Clearigate, Komeen, K-TEA, Nautique, Captain)

Target Plants

Algae - Cutrine Plus, K-TEA, Captain

Submersed species (Hydrilla, Brazilian elodea, pondweed and southern naiad) - Komeen, Nautique, Cutrine Plus, Clearigate, and Captain

Application Rate

Algae - Treatment concentration of 0.2-0.5 parts per million of copper. Submersed species - 0 part per million of copper (12-16 gallons per acre) or mix two gallons of copper complex and two gallons of Diquat per acre.

Cost - Copper products cost about $17 per gallon. Assuming an application rate of 16 gallons per acre and an application cost of $41 per acre, the total cost would be $313 per acre.

Use Considerations - Copper may be toxic to fish and aquatic invertebrates at recommended application rates, especially in soft water. Copper-based product should be carefully applied and monitored to minimize the risk of fish kills.

Water Use Restrictions - Copper complexes may be used in domestic and irrigation water supplies without water use restrictions.

D. Endothall - (Aquathol, Aquathol K, Aquathol Super K granular, Hydrothol 191granular and liquid)

Target Plants

Aquathol products are effective for submersed species such as naiads, bladderwort, coontail, watermilfoil, pondweed, hydrilla, and cabomba

Hydrothol 191 is effective on the species listed above as well as filamentous and macrophytic algae.

Application Rate

Aquathol

Liquid form (Aquathol K) - three gallons or more per acre depending on the target species. Granular form - Aquathol: 54-323 pounds per acre depending on water depth and the target species.

Aquathol Super K: 22-66 pounds per acre depending on the water depth and the target species.

Hydrothol 191

Heavy Infestations - Evenly spread 160 - 270 pounds per acre foot of water (0 - 0 ppm) applied evenly. Moderate or light infestations - Use 55 - 110 pounds per acre foot (0 - 0 ppm) applied evenly.

Cost

Aquathol

Aquathol K costs approximately $57 per gallon. Assuming an application rate of 5 gallons per acre and an application cost of $41 per acre, the total cost would be $326 per acre. Aquathol Super K costs about $15 per pound at an application rate of 30 pounds per acre and an application cost of $47 per acre, the total cost would be $510 per acre.

Hydrothol 191

Hydrothol 191 costs approximately $64 per gallon. Assuming an application rate of 7gallons per acre and an application cost of $41, the total cost would be $492 per acre.

Hydrothol 191 granular costs approximately $78 per pound. Assuming an application rate of 240 pounds per acre and an application cost of $47, the total cost would be $714 per acre.

Use Considerations - Concentrated endothall formulations are toxic to man if ingested or absorbed through the skin. They are also irritating to the skin and eyes. Avoid contact with or drift to other crops or plants as injury may result. Generally not toxic to fish at normal use concentrations, however, fish may be killed by dosages of Hydrothol 191 in excess of 0.3 ppm.

Water Use Restrictions - Water treated with endothall cannot be used for watering livestock, preparing agricultural sprays for food crops, for irrigation or domestic purposes for 7 to 25 days after treatment (depending on treatment concentration) or until such time that the water does not contain more than 0.2 ppm of endothall. Do not use fish from treated areas for feed or food for three days after treatment.

E. Glyphosate (Rodeo, Aquastar, Touchdown Pro)

Target Plants - Emergent broadleaf plants and grasses such as alligatorweed, water primrose, smartweed, and Phragmites.

Application Rate - Up to 7 1/2 pints per acre, the specific rate depending on the target species.

Cost - Glyphosate products range in price from $21-$39 per gallon. At an application rate of 5 pints per acre and an application cost of $41 per acre, the total would range from $63-$78 per acre per application.

Use Considerations - Glyphosate is not toxic to mammals, birds or fish at recommended use concentrations. Glyphosate products with aquatic labels can be used in and around aquatic sites, including all bodies of fresh and brackish water which may be flowing or nonflowing.

Water Use Restrictions - Do not apply within 0.5 miles upstream of potable water intakes unless water intake is shut off for 48 hours. There are no restrictions on water use for irrigation or recreation after treatment.

F. Fluridone (Sonar, Avast)

Target Plants - Primarily submersed plants, such as hydrilla, Brazilian elodea, watermilfoil, pondweeds, duckweeds and naiads; also effective on lilies and some grasses.

Application Rate Liquid form (Sonar AS, Avast) - 1-4 pints per acre depending on water depth. Pellet forms (Sonar PR, Sonar SRP, Avast SRG) - 15 to 80 pounds per acre depending on water depth.

Cost - The liquid formulation ranges from $1468-$1650 per gallon. Assuming an application rate of 5 pints per acre (2 pounds active ingredient per acre) and an application cost of $40 per acre, the total cost would be $349 per acre per application. The pellet formulations range in price from $200-$200 per pound. Assuming an application rate of 20 pounds per acre (2 pounds active ingredient per acre) and an application cost of $47 per acre, the total cost would be $567 per acre per application.

Use Considerations - In large lakes and reservoirs fluridone should be applied to areas greater than five acres. This herbicide requires a long contact time and is not effective in sites with significant water movement or rapid dilution. Fluridone is slow acting and may require 30 to 90 days to achieve desired control under optimal conditions. Unlike other aquatic herbicides, fluridone has proven effective in inhibiting viable hydrilla tuber production.

Water Use Restrictions - Do not apply within 1/4 mile of a functioning potable water intake unless concentrations are less than 20 ppm. Water treated with fluridone cannot be used for irrigation for 7-30 days depending on target crop.

G. Imazapyr (Habitat)

Target Plants - Phragmites, Alligatorweed, Water primrose, and Cutgrass.

Application Rate - 1 to 6 pints per acre depending on target species.

Cost - Habitat (Imazapyr) costs $245 per gallon. Assuming the application rate of 16 oz. per acre and an application cost of $41 per acre, the total cost would be $78 per acre.

Use Considerations - Applications to public waters can only be made by federal, state, or local agencies or those applicators which are licensed or certified as aquatic pest control applicators and are authorized by state or local agencies. Do not use in close proximity to hardwoods.

Water Use Restrictions - Do not apply within ½ mile of potable water intakes. For applications within ½ mile of a potable water intake, the intake must be turned off for a minimum of 48 hours. Do not apply within 1 mile of active irrigation intakes on still or slow moving waters. Irrigation water usage may be continued 120 days after application or when Habitat (Imazapyr) residue levels are determined by laboratory analysis to be 0 ppb or less.

Aerial Applications may only be made by helicopter.

H. Imazamox (Clearcast)

Target Plants - Phragmites, Alligatorweed, Water primrose, and Cutgrass.

Application Rate - 1 to 6 pints per acre depending on target species.

Cost -Clearcast (Imazamox) costs $175 per gallon. Assuming the application rate of 16 oz. per acre and an application cost of $41 per acre, the total cost would be $63 per acre.

Use Considerations - Applications to public waters can only be made by federal, state, or local agencies or those applicators which are licensed or certified as aquatic pest control applicators and are authorized by state or local agencies. Can be used in close proximity to hardwoods

Water Use Restrictions - Do not apply within ½ mile of potable water intakes. For applications within ½ mile of a potable water intake, the intake must be turned off for a minimum of 48 hours. Do not apply within 1 mile of active irrigation intakes on still or slow moving waters. Irrigation water usage may be continued 120 days after application or when Habitat (Imazapyr) residue levels are determined by laboratory analysis to be 0 ppb or less.

Aerial Applications may only be made by helicopter.

I. Triclopyr (Renovate 3, Tahoe)

Target Plants - Alligatorweed, Eurasian watermilfoil, water hyacinth, parrotfeather, and water primrose.

Application Rate - 2-8 qts. per acre depending on target species.

Cost - Triclopyr products cost $96 per gallon. Assuming the application rate of 2 qts per acre and an application cost of $41 per acre, the total cost would be $89 per acre.

Use Considerations - Triclopyr is not toxic to fish or wildlife at normal use concentrations. It can cause severe irritation to eyes and skin upon contact. It is suggested that it is used in a manner to reduce the possibility of drift. The proper personal protective equipment should be used as prescribed by the Federal label.

Water Use Restrictions - For floating and emergent applications do not apply within 200 feet of operating potable water intakes when using 4 - 8 qts per acre. There are no setback restrictions for potable water intakes when 2 qts. per acre or less is applied to emergent vegetation. To make applications within these restricted areas, follow the label directions. There are no restrictions on the use of treated water for recreational purposes or for livestock consumption.

J. Penoxsulam (Galleon SC)

Target Plants

Submersed species – Hydrilla, Cabomba, Egeria, Eurasian watermilfoil

Floating species – Floating species – Water hyacinth, Water lettuce, Water fern, Duckweed, Frog's bit, Mosquito fern

Application Rates

0.174 fl oz per acre foot to achieve minimum effective concentration of 25 – 75 ppb.

Floating species – 2- 6 fl oz per acre as foliar application.

Cost – Penoxsulam costs approximately$1650 per gallon. Assuming an application rate of 11 fl oz per acre and an application cost of $41 per acre, total cost would be $183 per acre for submersed plants. Assuming an application rate of 6 fl oz per acre, and an application cost of $41 per acre, total cost would be $113 per acre for emergent plants.

Use considerations – Penoxsulam has no potable water restrictions or irrigation restrictions except for irrigation of food crops. It must have prolonged contact times similar to fluridone (>21 days).

Water Use Restrictions - Food crop irrigation waters cannot be used if penoxsulam concentrations are above 1ppb

II. Biological Control

Alligatorweed Flea Beetle (Agasicles hygrophila)

Target Plant - Alligatorweed

Stocking Rate - 600-1,000 per acre.

Cost - The U.S. Army Corps of Engineers office in Palatka, Florida will provide lots of 6,000 flea beetles for the cost of shipping which is about $50 per shipment. Flea beetles may also be obtained from the U.S. Department of Agriculture.

Use Considerations - Flea beetles feed only on alligatorweed and pose no threat to desirable plant species. They produce no adverse impact on the aquatic environment. As with all biological control agents, flea beetles may not remain in the area where stocked but may migrate to other areas of alligatorweed infestation. These insects are not able to survive severe winters and may require occasional restocking. The effectiveness of these insects may be enhanced by use with an aquatic herbicide such as 2, 4-D, or Rodeo.

Alligatorweed Stem Borer Moth (*Vogtia malloi*)

Target Plant - Alligatorweed

Cost - Approximately the same as for flea beetle.

Use Considerations - Same as for flea beetle.

Alligatorweed Thrip (*Amynothrips andersonii*) - This insect feeds on alligatorweed and has been stocked in South Carolina It has failed to become established in the State and is considered less desirable than flea beetles or stem borers for control of alligatorweed.

D. Triploid White Amur or grass carp (*Ctenopharygodon idella*)

Target Plant - Primarily submersed plants including Brazilian elodea, hydrilla, bladderwort, coontail, naiads, pondweeds.

Cost - Triploid white amur cost $4 to $7 each. At a stocking rate of 15 to 25 fish per vegetated acre, the total cost could range from $60 to $175 per acre.

Use Considerations - Only the triploid (sterile) white amur may be stocked in South Carolina for aquatic weed control. Introduction and stocking of this fish is regulated by the S.C. Department of Natural Resources and requires a permit. Escapement over some dams may occur during high flow periods. Use of barriers in some lakes should prevent fish loss. While grass carp are effective on a wide variety of submersed plants, they generally do not provide effective control of watermilfoil species. Plants should be carefully identified prior to stocking to ensure proper stocking rates and potential efficacy.

E. Tilapia (Tilapia sp.) - Several species of this herbivorous fish have been used to control filamentous algae and submersed macrophytes. Tilapia cannot overwinter in South Carolina Introduction of fish is regulated by the S.C. Department of Natural Resources.

III. Mechanical Control

Harvesters, Cutters, Dredges and Draglines

Target Plants - All species

Cost - Harvesters range in cost from $5,000 to over $150,000 for the initial investment. Operating cost range from $300 to $700 per acre.

Use Consideration - Harvesters can be used in irrigation and drinking water supplies without water use restrictions. They may actually spread some plants such as Brazilian elodea and hydrilla by dispersing plant fragments which form new colonies. Harvesting requires the availability of a land disposal site for harvested plants. These devices cannot be used on water bodies which have debris and obstructions which interfere with operation. Harvesters are slow, with a maximum coverage of about five acres per day.

Fiberglass Bottom Screens

Target Plants - All species which root in the bottom.

Cost $10,000 per acre.

Use Considerations - Bottom screens may be detrimental to bottom-dwelling aquatic organisms. Due to high cost, use is usually restricted to beaches and other swimming areas where a relatively small area of control is required.

IV. Environmental Alterations

Water Level Manipulation - Some species of aquatic plants can be controlled by a periodic raising or lowering of water level. Shoreline grasses, cattails, and Phragmites can be controlled, to some extent, by maintaining higher than normal water levels during the plant growing season. Periodic lowering of water and drying of the bottom can reduce abundance of a number of submersed and emersed species. Disadvantages are that water level fluctuation can adversely affect water uses such as recreation, hydroelectric power production, wildlife protection, and others. Also, some plant species may actually be favored by water level variations. Many factors must be considered before using this method for aquatic plant control.

Reduction in Sedimentation and Nutrient Loading - Sedimentation decreases depth of the water body and increased the area where aquatic plants can grow. Nutrient enrichment resulting from man's activities usually does not create aquatic plant problems, but does contribute to existing problems. Reduction in these two environmental factors can assist in aquatic plant management, but is not a sufficient control method by itself. The mechanism for control of these factors is through implementation of Best Management Practices for Control of Non-Point Source Pollution developed by the S.C. Department of Health and Environmental Control, and through the wastewater discharge permitting program (NPDES) also administered by the S.C. Department of Health and Environmental Control.

APPENDIX F

SCDNR and Santee Cooper
Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes

S.C. Department of Natural Resources and Santee Cooper Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes

MEMORANDUM OF AGREEMENT

BETWEEN SANTEE COOPER AND SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

REGARDING AQUATIC PLANT AND HABITAT MANAGEMENT GOALS FOR THE SANTEE COOPER LAKES

This AGREEMENT (hereinafter "Agreement") is between Santee Cooper (hereinafter "S-C") and the South Carolina Department of Natural Resources (hereinafter "DNR"). This Agreement is effective on the date of the last signatory to the Agreement.

WHEREAS, S-C and DNR recognize Lakes Marion and Moultrie (hereinafter "Lakes") as a significant natural resource of the State of South Carolina, and

WHEREAS, in order to provide balanced benefits to natural resources and the multiple uses of the Lakes,DNR and S-C (hereinafter "Parties") agree to cooperate in the management of aquatic vegetation and the habitat that it provides, and

WHEREAS, the Parties' goal is to maintain, at a minimum, 10% of the surface area of the Lakes as beneficial vegetated habitat for waterfowl, wildlife, fish and other aquatic organisms,

THEREFORE, in order to achieve this goal, the Parties agree to the following:

13) The aquatic plant management goal for the Lakes is to achieve a diverse assemblage of native aquatic vegetation in and on, at a minimum, 10% of the total surface area of the Lakes and to effectively control non-native invasive species. The aquatic plant coverage should include a combination of submerse, floating leaf, and emergent plant species that provide habitat and food to game and non-game fish and wildlife species. The goal would be for this vegetation to be distributed throughout the Lakes.
14) S-C will annually monitor the vegetative community and extent of coverage. This monitoring may include aerial photography, visual surveys, hydro-acoustic transects and other appropriate measures as deemed necessary by the Parties in the annual work plan, in order to map plant species and coverage. An annual report of the monitoring results will be completed at the end of each growing season and provided to the Parties prior to preparation of the work plan for the following year.
15) The Parties will cooperate in monitoring the health of the fishery and in monitoring of wintering waterfowl populations. Wintering waterfowl population monitoring may consist of aerial or other census techniques as deemed appropriate by the Parties. When waterfowl census is utilized, DNR will provide personnel and prepare an annual report to be distributed to both agencies, and S-C will provide the flight time.
16) Sterile grass carp will continue to be a major component of the long-term management strategy in controlling hydrilla *(Hydrilla verticillata).* The Parties will meet at least annually to review the monitoring data and to develop recommendations for maintenance stocking levels and other control strategies. These recommendations will be jointly presented to the South Carolina

Aquatic Plant management Council (hereinafter "Council"). The implementation of these recommendations will be subject to approval by the Council.

17) Aquatic vegetation will not be controlled in Santee Cooper Project water bodies that are totally isolated from the Lakes unless it conflicts with specific water uses or is identified as a state or federal noxious weed and poses a threat to the Lakes.
18) Localized aquatic vegetation control using approved chemical or mechanical methods may be necessary in areas where vegetation interferes with hydroelectric power production or other legitimate uses of the Lakes regardless of plant coverage and distribution.
19) In order to enhance native plant growth and habitat throughout the lake system, the Parties will cooperate in implementing innovative management techniques. These techniques could include such measures as, introducing desirable native plant species, enhancing wildlife/waterfowl management areas, and implementing strategic lake level management measures.
20) The Parties will meet annually to review the results of monitoring and treatment programs to determine the effectiveness of the programs, and to develop annual work plans.
21) Every five years the Parties will meet to conduct a comprehensive review of the programs and to determine the success in meeting the overall management goals. Based upon this review, the provisions of this agreement may be modified, as deemed appropriate, by the mutual consent of the Parties.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the date hereof.

SANTEE COOPER

By: R.M. Singletary, III

Date: 2/3/2010

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

By:

Date: 2-22-10

APPENDIX G

Summary of Aquatic Plant Control Expenditures

SUMMARY OF AQUATIC PLANT CONTROL EXPENDITURES

During 1981, the Council received $60,000 in Federal matching funds through the U.S. Army Corps of Engineers. The Council allocated $57,000 of these funds to the S.C. Public Service Authority for plant management at Lake Marion. The Authority used these funds to chemically treat approximately 500 acres of the area uplake of the Rimini railroad trestle. The herbicide diquat was used to treat for Brazilian elodea and other submersed weed species. The remainder of the Federal funds were used to assist in development of the Council's management program.

During 1982, $30,000 in Federal funds were allocated to the S.C. Public Service Authority for control of hydrilla and other nuisance plants at Lake Marion. An additional $13,500 were allocated to Berkeley County for control of water hyacinths at Goose Creek Reservoir.

During 1983, $155,000 in Federal matching funds were allocated to the S.C. Public Service Authority for plant control at Lake Marion. These funds were used to treat approximately 1,400 acres of upper Lake Marion with diquat, endothall and fluridone for control of Brazilian elodea, hydrilla and other submersed plants. The Council also provided $4,500 in Federal matching funds to Berkeley County for maintenance control of water hyacinths at Goose Creek Reservoir.

During 1984, $249,500 in Federal funds and $40,500 in State funds were allocated to the S.C. Public Service Authority for aquatic weed control at Lake Marion. The S.C. Electric and Gas Company was allocated $25,000 for control of hydrilla and other submersed aquatic weeds at Back River Reservoir. Berkeley County was allocated $5,000 for maintenance control of water hyacinth at Goose Creek Reservoir.

Calendar year 1985 represented the first year of significant funding for aquatic plant management in South Carolina since the establishment of the Aquatic Plant Management Program in 1980. Funding was available from State and Federal sources over separate fiscal years. A total expenditure of $701,349 was used to control nuisance aquatic plant populations on 29 water bodies around the State. Of this expenditure, $98,377 was used for biological control by triploid grass carp and $602,972 was used for chemical control operations.

During 1986, a mild winter coupled with low lake levels and clear water due to a severe drought resulted in an abundance of submersed aquatic plants. Hydrilla populations in Lake Marion and Back River Reservoir increased in coverage and new populations were discovered in the Cooper River ricefields. A total of 38 water bodies (4,925 acres) were managed for aquatic weeds at a cost of $704,090. Herbicide applications were made on 33 lakes (4,441 acres) at a cost of $673,979. Biological controls were implemented on nine water bodies around the State at a cost of $30,111.

During 1987, a total of $604,695 in State and Federal funds were expended for aquatic weed control in public waters. Chemical control work amounting to $599,445 was conducted in 26 public water bodies. Biological control, including stocking triploid grass carp and alligatorweed flea beetles, was conducted at eight water bodies for a total expenditure of $5,250.

During 1988, a total of $631,164 in State, Federal, and local funds were expended for aquatic plant control activities in 25 water bodies. Because of reductions in the amount of Federal match from 70

percent to 50 percent of total control cost, local sponsors were for the first time required to provide at least 15 percent of control costs. Approved aquatic herbicides were applied to 3,258 acres on 21 water bodies at a total cost of $583,764. Biological controls were implemented on four water bodies at a cost of $47,400.

During 1989, a total of $827,630 in Federal, State, and local funds were expended for aquatic plant control operations in 23 water bodies. Aquatic herbicides were applied to 2620 acres on 21 water bodies at a cost of $422,009. A three year triploid grass carp stocking project was initiated on Lake Marion with the release of 100,000 sterile grass carp. Because this represents the largest such stocking in the country to date, biological control expenditures were substantially higher than in previous years, totaling $405,621.

During 1990, a total of $944,194 were expended for aquatic plant control activities on 24 water bodies. Herbicide treatments were made to all water bodies (2850 acres) at a cost of $524,194. Lake Marion received its second installment of 100,000 triploid grass carp at a cost of $420,000. Because of limited federal funds and a substantial increase in local funds (primarily from Santee Cooper), this was the first year that there were insufficient federal funds available to match all planned control operations. The Corps of Engineers provided 47 percent of total funding, while state and local entities provided 16 percent and 37 percent, respectively.

In 1991, aquatic plant management operations were conducted on 18 public water bodies at a total cost of $1,965,387. The exceptionally large expenditure was a result of emergency control operations to alleviate blockage of the St. Stephen Hydroelectric facility on Lake Moultrie by hydrilla A record high 6838 acres was treated with aquatic herbicides at a cost of $1,505,771. Biological control agents were used on five lakes at a cost of $459,615. Most of this included the third stocking of triploid grass carp in upper Lake Marion. While 50 percent of program funding was provided by the U.S. Army Corps of Engineers, 9 percent was provided by the State and 41 percent by local entities.

In 1992, 22 water bodies received control operations at a total cost of $1,859,709. While last year's expenditures were higher, over 1,000 acres were treated by Santee Cooper at a cost of over $200,000 but were not cost shared through the State program. Fifty percent of funding was provided by the U.S. Army Corps of Engineers, 8 percent by the State, and 42 percent by local entities. About 6,888 acres were treated with aquatic herbicide at a cost of $1,447,864. Biological control agents (sterile grass carp and Tilapia) were introduced to six water bodies at a cost of $411,845. This was the first year in which widespread hydrilla control was evident in upper Lake Marion from the grass carp. Hydrilla was controlled in over 6,500 acres in Stumphole, Low Falls, Elliotts Flats, and tree line areas. Compared to 1990 coverage, this represents an 80 percent reduction.

During 1993, a total of $2,050,736 were expended for aquatic plant control activities on 27 water bodies. Forty-six percent of the funding was provided by the U.S. Army Corps of Engineers, 5 percent by the Department of Natural Resources, and 49 percent by various local sponsors. Aquatic herbicide treatments were made on 23 water bodies (8,125 acres) at a total cost of $1,828,335. Biological control agents (grass carp and tilapia) were used on 11 lakes at a cost of $222,400. Grass

carp stocked in upper Lake Marion in 1989-92 provided control (over 9,000 acres) for the second consecutive year. As a result of this success, stocking efforts were initiated in Lake Moultrie with the release of 50,000 grass carp. Hydrilla was discovered in Lake Murray this year resulting in unplanned treatment operations at several boat ramps and swimming beaches.

During 1994, aquatic plant management operations were conducted on 28 water bodies at a total cost of $2,876,763. The U.S. Army Corps of Engineers provided 50 percent of all funds, while the State provided 7 percent and local entities provided 43 percent. Aquatic herbicide treatments were conducted on all water bodies (9,090 acres) at a cost of $2,370,025. Grass carp were stocked in five lakes to control 10,242 acres at a cost of $506,738. Lake Moultrie received the most grass carp (150,000 fish) to help increase the number of fish to target levels. Grass carp continue to control over 9,000 acres in upper Lake Marion for the third straight year. This year hydrilla was found in Lake Wateree for the first time resulting in unplanned treatments to attempt to eliminate it.

In 1995, a total of $2,804,206 were expended for aquatic plant control activities on 30 water bodies. Fifty percent of the funding was provided by the U.S. Army Corps of Engineers, 44 percent was provided by local sponsors, and the state contributed 6 percent. Some level of herbicide treatment occurred on all the water bodies totaling about 9,710 acres at a cost of $2,367,622. A total of 97,526 grass carp were stocked in five lakes at a total cost of $435,084. Most of these were stocked in the Santee Cooper lakes (91,000) and Goose Creek Reservoir (6,000). Hydrilla was found in Lake Keowee for the first time this year which resulted in an unplanned treatment. Also Salvinia molesta, a federal noxious weed, was discovered in a private pond in Colleton County. Efforts were made to eradicate the infestation with treatments by the landowner and the state. Grass carp continue to provide excellent control in over 9,000 acres in upper Lake Marion; however, floating water hyacinths now infest much of this area impacting primarily shoreline and swamp areas.

Control expenditures in 1996 were about one-half of those in 1995 due in part to successful results from control efforts in previous years and in part to reductions in federal funding. A total of 19 water bodies were managed for nuisance species at a total cost of $1,151,501; the Corps of Engineers provided 31%, the State provided 10%, and local entities provided 59%. Herbicide treatments were conducted in 4,920 acres at a cost of $888,685; biocontrol agents were used in four lakes at a cost of $262,816. Hydrilla coverage on the Santee Cooper lakes (Lakes Marion and Moultrie) declined by almost 80% due apparently to the successful stocking of sterile grass carp. As a result, herbicide treatments of hydrilla were reduced by a comparable amount. Hydrilla coverage has been essentially eliminated on Lake Wateree and substantially reduced on Lake Keowee through a combination of herbicide treatments and drawdowns. A large drawdown and treatment on Lake Murray this year is hoped to have similar results.

During 1997, aquatic plant management operations were conducted on 21 water bodies at a total cost of $459,783. This represents a 60% reduction from control costs in 1996 due to very successful hydrilla management efforts on the Santee Cooper lakes and Lake Murray coupled with limited Federal matching funds. Matching funds from the Corps of Engineers composed only 2 percent of total costs, while State and Local funds made up 38 percent and 60 percent, respectively. Sterile grass carp were stocked in five lakes to control 292 acres of submersed plants at a cost of $15,951.

Aquatic herbicides were used to treat 3,762 acres at a total cost of $443,832. Most herbicide treatments (58%, 2,181 acres) were focused on water hyacinth which has expanded its range and now is found on six major water bodies. Water hyacinth treatments on the Ashepoo River were greater than originally planned and treatments on the Waccamaw River were unanticipated. Hydrilla coverage on the Santee Cooper lakes continued to decline in 1997 due to successful control by sterile grass carp resulting in sharp reductions in management expenditures. The drawdown and herbicide treatment on Lake Murray in 1996 resulted in better than anticipated hydrilla control this year. Hydrilla acreage was reduced 88 percent with a 45 percent reduction in shoreline miles.

Limited hydrilla coverage on the Santee Cooper Lakes, Lake Murray and Goose Creek Reservoir during 1998 helped reduce overall control expenditures for the third consecutive year. Total control cost for 1998 were 40% less than in 1997. A total of 1,862 acres on 17 water bodies were managed at a cost of $273,223. The Department of Natural Resources provided 47% of total funding, while 25% was provided by the Corps of Engineers, and 28% by various local entities. Sterile grass carp are effectively controlling hydrilla growth in the Santee Cooper Lakes and Goose Creek Reservoir. About one-half of all herbicide treatments (940 ac.) were focused on water hyacinth control on coastal rivers and impoundments.

A total of 3,259 acres on 19 water bodies were managed in 1999 at a total cost of $453,071. Funding support was 34% State (SCDNR), 21% Federal (USACOE), and 45% local match. Most herbicide treatments (1506 acres, 46%) were directed at controlling the growth of water hyacinth in seven water bodies. Hydrilla growth remains limited statewide due to control operations in previous years. Grass carp in the Santee Cooper Lakes (Lakes Marion and Moultrie) and Goose Creek Reservoir are effectively controlling hydrilla growth in those lakes. Hydrilla regrowth was evident in Lake Murray at the end of the year; however, higher than normal lake levels restricted herbicide treatments. Therefore, significant regrowth is expected next year.

During 2000, aquatic plant management operations were conducted on 21 water bodies at a total cost of $483,236. State budget cuts at the end of the calendar year reduced control efforts by 21% of planned expenditures and shifted costs to local sponsors. Seventy percent of total costs were borne by local entities with the state paying the rest. Most of the control effort was focused on water hyacinth (31%), followed by hydrilla (25%) and Pithophora (19%). Hydrilla regrowth was significant on Lake Murray as predicted. Grass carp continue to control hydrilla on Goose Creek Reservoir and Lake Marion and Lake Moultrie.

During 2001, aquatic plant management operations were conducted on 2,775 acres on 25 water bodies at a total cost of $508,075. Due to State budget cuts virtually all control costs were paid for with federal (41%) and local funds (59%). Hydrilla treatments were up this year (1,550 acres) because of a resurgence of hydrilla growth on Lake Murray; however, water hyacinth treatments were especially low (186 acres) due to a very cold period in December. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

During 2002, aquatic plant management operations were conducted on 2,239 acres on 17 water bodies at a total cost of $297,236. Due to State budget cuts virtually all control costs were paid for with federal (37%) and local funds (63%). Water hyacinth treatments were up this year (1,186 acres)

because of a milder than normal winter; however, hydrilla treatments were especially low (390 acres) due to the inability to treat Lake Murray. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

In 2003, aquatic plant management operations were conducted on 61340 acres in 12 water bodies at a total cost of $639,328. Due to state budget cuts all control costs were paid for with federal (38%) and local funds (62%). Included in this total are the stocking of 64,500 sterile grass carp in Lake Murray to control 4300 acres of hydrilla at a cost of $369,529. About 57% of all herbicide treatments (1005 ac.) were focused on water hyacinth control on coastal rivers and impoundments. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

A total of 2764 acres were treated in 2004 at a total cost of $470,815. Local sponsors provided 41% of the cost, while the Corps of Engineers provided 30%. Funds from the State's Water Recreational Resource Fund (boat gas tax) paid for 29% of all control costs. The focus of most control was on water hyacinth (931 acres) and Phragmites (710 acres). Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes. Preliminary surveys of Lake Murray indicate that grass carp stocked in 2003 are beginning to provide some control of hydrilla. The drawdown on Lake Murray over the past two years is also providing good hydrilla control in the drawdown zone.

In 2005 the focus of the Aquatic Nuisance Species Program was Phragmites control in coastal South Carolina, 1983 acres were treated at a cost of $349,174. In all, a total of $655,535 was spent on 3,935 acres of control of invasive plants. Local sponsors provided 32% of the cost, while the Corps of Engineers provided 35%. Funds from the State's Water Recreational Resource Fund (boat gas tax) paid for 33% of all control costs. Grass carp continue to provide effective control of hydrilla on the Santee Cooper Lakes and have provided excellent control on Lake Murray.

For 2006, Phragmites control was center stage and once again led the control efforts with 1950 acres treated at a cost of $352,804. This is second only to last year's acreage of phragmites treated. In total 3983 acres of invasive species were treated at a cost of $722,316. Funding from the Corps of Engineers was not available this year and the costs were almost evenly split between the local cost share monies and Water Recreation funds. Additional funding was used from the U.S. Navy, Naval Weapons Station in Goose Creek. Included in that total was 242 acres of Phragmites and about 70 acres of pond work in the Marrington Recreation are Findings in Goose Creek Reservoir and the Santee Cooper Lakes indicate that additional stockings of triploid grass carp may need to be reconsidered in 2007.

Increasing hydrilla and the abundance of native submersed vegetation in 2007 brought about maintenance stocking of Triploid Grass Carp in Lake Marion, Lake Moultrie, and Goose Creek Reservoir. A total of 2620 sterile carp were stocked in the Santee Cooper Lakes with an additional 185 fish stocked into Goose Creek Reservoir. In total 4208 acres of invasive species were treated at a cost of $773,263. Costs were almost evenly split between the local cost share monies and Water Recreation funds. Additional funding was used from the U.S. Navy, Naval Weapons Station in Goose Creek and U. S. Army Corps of Engineers for treatment of phragmites on spoil areas in Charleston

Harbor and the Intracoastal Waterway. Santee coastal WMA managers should now have gained the upper hand with an additional 714 acres treated on Santee Coastal. Yawkey continued treatment of phragmites (120 acres) with several problem areas which remain persistent throughout treatment. Additionally 904 acres of phragmites have been treated from Colleton County through Georgetown County.

2008 showed a rebound of hydrilla across the state. Hydrilla was discovered in several new sites and at some old sites this highly invasive species increased abundantly. Triploid grass carp maintenance stocking plans are being reconsidered because of the increased levels of hydrilla in the Santee Cooper Lakes and Goose Creek Reservoir. Cooperative efforts with Duke Energy, Lake Wylie Marine Commission, South Carolina DNR, and North Carolina wildlife agencies produced a management plan for the border lake, Lake Wylie. 3335 acres of invasive species were treated at a cost of $641,791. Costs were split approximately 44% local cost share monies and 56% Water Recreation funds. Phragmites sites continued to decline in acreage and new cooperative agreements were put in place for water hyacinth control on public and private areas along the Pee Dee and Waccamaw Rivers. This agreement includes SCDNR, the U.S. Fish and Wildlife Service, the Nature Conservancy, and private landowners. New problems tackled by the ANS program include a highly invasive snail species in the Socastee area of Horry County (111 acres at $3,671) and a toxic algae problem in Hopeland Gardens in Aiken, S.C.

Budget problems in 2009 limited state level cost-share. In all 65% of total costs for control in South Carolina was absorbed by the local entities, along with 35% State Water Recreational Resource funds and 2% Federal funds. Through innovative control measures and perseverance by ANS staff, control efforts were not severely hampered. Triploid grass carp were stocked for the first time in Lake Greenwood to control an ever increasing hydrilla population. This stocking had limited success as hydrilla numbers grew throughout the summer months to double the original acreage. Maintenance stocking of the Santee Cooper Lakes and Goose Creek Reservoir was accomplished. In 2009 2,867 acres of control work was done at a total cost of $572,588. Santee Cooper control was about 38% of the total acreage treated. Phragmites control was a key component of habitat restoration for waterfowl and other species and resulted in 424 acres of control efforts which is down from previous years because of efficacy of previous control efforts.

During FY 2010, aquatic plant management operations by the ANS Program were conducted on 28 different management sites at a cost of $271,003 using local and State Water Recreation Resource funds. Field operation expenditures for the SCDNR decreased by 2% from FY 2009-2010 while acres controlled (2091, +18%) increased. This occurred by utilizing more efficient survey and treatment schedules along with the increased efficacy of newer herbicides brought about by a renewed state contract. Budget problems in 2010 limited state level cost-share. In all, 42% of total costs for control in South Carolina were absorbed by the local entities along with 58% State Water Recreational Resource funds. Through innovative control measures and perseverance by ANS staff, control efforts were not severely hampered. Triploid grass carp stocked in Lake Greenwood had good success as hydrilla acreage numbers plummeted to near zero. Maintenance stocking of the Santee Cooper Lakes and Goose Creek Reservoir was accomplished; with results in Goose Creek Reservoir showing decreased submerged invasives and the results are pending based on aerial GIS surveys to be completed on Santee Cooper. 2,091 acres of control work was done in state waters.

Habitat restoration for waterfowl and other species continues on Santee Coastal, Yawkey, Samworth, Donnelley, and Santee Delta. Early reports from those areas show an increase in useable habitat for waterfowl with increased bird numbers. Santee Cooper, which received no cost share funding, completed 2,438 acres at a cost of $785,621. Acreage increases statewide and on Santee Cooper are almost entirely based on significant expansion of two new highly invasive species, *Nymphoides cristata* (crested floating heart) and *Pomacea insularum* (Island Applesnail). In all 4,519 acres of invasives were treated in South Carolina public waters at a total cost of $1,056,624.

Table 2008-A. Summary of Expenditures by Source for Control Operations During 2008.

	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	ACE Basin	$1,510	$755	$755	$0	USF&W
2	Back River Reservoir	$68,783	$34,391	$34,391	$0	SCE&G, CPW
3	Baruch	$9,396	$4,698	$4,698	$0	Baruch
4	Black Mingo Creek	$184	$92	$92	$0	Georgetown Co.
5	Black River	$551	$276	$276	$0	Georgetown Co.
6	Bonneau Ferry WMA	$6,293	$772	$5,520	$0	SCDNR
7	Boyd Pond	$2,450	$1,225	$1,225	$0	Aiken County
8	Cape Island	$2,565	$1,283	$1,283	$0	USF&W
9	Caw Caw Park	$767	$383	$383	$0	Charleston Parks
10	City of Aiken	$84	$42	$42	$0	City of Aiken
11	Cooper River	$38,985	$19,492	$19,492	$0	Berkeley Co.
12	Dungannon WMA	$686	$343	$343	$0	SCDNR, USF&W
13	Georgetown Parks	$8,271	$3,725	$4,546	$0	Georgetown Co.
14	Goose Creek Reservoir	$32,213	$16,106	$16,106	$0	CPW
15	Horry County	$3,671	$0	$3,671	$0	SCDNR
16	Lake Cunningham	$7,700	$3,850	$3,850	$0	Greer CPW
17	Lake Greenwood	$49,073	$24,537	$24,537	$0	Greenwood Co.
18	Lake Murray	$0	$0	$0	$0	SCE&G, Lexington Co.
19	Little Pee Dee River	$224	$112	$112	$0	Horry Co.
20	Pee Dee River	$303	$152	$152	$0	Georgetown Co.
21	Samworth WMA	$11,528	$5,764	$5,764	$0	SCDNR
22	Santee Coastal Reserve	$60,400	$24,160	$36,240	$0	SCDNR
23	Santee Delta WMA	$9,396	$4,698	$4,698	$0	SCDNR
24	US Naval Weapons Sta.	$16,386	$0	$16,386	$0	US Navy
25	Waccamaw River	$6,142	$1,558	$4,584	$0	USF&W
	State Parks					
26	Barnwell SP	$1,005	$503	$503	$0	SCPRT
27	Charlestown Landing SP	$87	$43	$43	$0	SCPRT
28	Cheraw SP	$804	$402	$402	$0	SCPRT
29	Goodale SP	$402	$201	$201	$0	SCPRT
30	H Cooper Black SP	$201	$101	$101	$0	SCPRT
31	Huntington Beach SP	$32	$0	$32	$0	SCPRT
32	Kings Mountain SP	$1,120	$560	$560	$0	SCPRT
33	Little Pee Dee SP	$2,010	$1,005	$1,005	$0	SCPRT
34	Poinsette SP	$1,005	$503	$503	$0	SCPRT
35	Sesquicentennial SP	$1,039	$402	$637	$0	SCPRT
	Santee Cooper Lakes		$30,868	$30,868		
36	Lake Marion	$61,737				Santee Cooper
37	Lake Moultrie	$7,927	$3,963	$3,963		Santee Cooper
	Sub Impondments	$225,768	$118,099	$107,668		Santee Cooper
	SCDNR Total	$337,557	$148,413	$189,144	$0	
	State Park Lake Total	$7,705	$3,719	$3,986	$0	
	Santee Cooper Total	$295,431	$152,931	$142,500	$0	
	Grand Total	$640,693	$305,063	$335,630	$0	

Table 2008-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2008

Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
Ace Basin	Phragmites	10.00	$1,510.00	$151.00	Habitat	0.500 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
	TOTAL:	10.00	$1,510.00	$151.00				
Back River Reservoir	Hydrilla	149.69	$46,590.63	$311.25	Komeen/Komeen-Reward	16 gal/ac/4 gal/ac-2gal/ac	Reduce problem plants to enhance public access, use, water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control Reward/Komeen mix proved to be more effective
	Water hyacinth	253.50	$20,277.18	$79.99	Renovate/Reward/Clearcast/ Habitat	0.250 - 0.500 gal/ac		90% control
	Water primrose	24.00	$1,914.79	$79.78	Renovate/Habitat	0.250 - 0.500 gal/ac		90% control
	TOTAL:	427.19	$68,782.60	$161.01				
Baruch Institute	Phragmites	70.00	$9,395.50	$134.22	Habitat	0.375 gal/ac	Reduce phragmites to enhance waterfowl habitat, public	>90% control
	TOTAL:	70.00	$9,395.50	$134.22				
Black River	Alligatorweed, Pennywort	6.00	$551.25	$91.88	Renovate	0.500 gal/ac	Reduce problem plants to enhance waterfowl habitat, public	> 95% control
	TOTAL:	6.00	$551.25	$91.88				
Black Mingo Creek	Alligatorweed, Pennywort	2.00	$183.75	$91.88	Renovate	0.500 gal/ac	Reduce problem plants to enhance waterfowl habitat, public	> 95% control
	TOTAL:	2.00	$183.75	$91.88				
Bonneau Ferry Misc Ponds &	Water Primrose, Water hyacinth,	54.00	$6,292.50	$116.53	Habitat/Clearcast Hardball	0.250 - 0.375 gal/ac	Reduce problem plants to enhance waterfowl habitat, public	>60% control
Reserves	Frog's bit, Lotus, Cutgrass,					3 gal/ac - 5gal/ac	access and use.	>90% control
	TOTAL:	54.00	$6,292.50	$116.53				
Boyd Pond	Watermilfoil	12.00	$2,412.00	$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance waterfowl habitat, public	>90% control
	Water primrose	0.50	$37.88	$75.76	Habitat	0.250 gal/ac	access and use.	>90% control
	TOTAL:	12.50	$2,449.88	$195.99				
Cape Island	Phragmites	15.00	$2,565.00	$171.00	Clearcast	0.500 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
	TOTAL:	15.00	$2,565.00	$171.00				
Caw Caw Natural Area	Phragmites	7.00	$766.50	$109.50	Habitat	0.500 gal/ac	Reduce phragmites to enhance waterfowl habitat, public	>90% control
	TOTAL:	7.00	$766.50	$773.50				
City of Aiken - Hopeland	Microcystis (toxic algae)	2.00	$84.00	$42.00	Green Clean	7.5 gal/ac	Reduce toxic algae concentration for public health reasons	> 95% control
	TOTAL:	2.00	$84.00	$42.00				
Cooper River	Hydrilla	36.25	$11,612.80	$320.35	Komeen/Aquathol	16 gal/ac/5 gal/ac	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control
	Water hyacinth	283.00	$27,371.75	$96.72	Renovate/Habitat/Clearcast/Reward	0.250 gal/ac-0.750 gal/ac		> 95% control
	TOTAL:	319.25	$38,984.55	$122.11				
Dungannon	Frog's bit, Cutgrass, water primrose, Alligatorweed	8.00	$686.00	$85.75	Clearcast	0.250 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control
	TOTAL:	8.00	$686.00	$85.75				
Georgetown Parks	Phragmites	51.25	$8,270.63	$161.38	Clearcast	0.500 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
	TOTAL:	51.25	$8,270.63	$161.38				
Goose Creek Reservoir	Water hyacinth	48.00	$4,036.25	$84.09	Renovate/Clearcast/Reward	0.250 gal/ac-0.500 gal/ac	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control
	Water lettuce	75.00	$7,576.05	$101.01	Renovate/Clearcast/Reward/ Galleon	0.1875 gal/ac-0.500 gal/ac		> 95% control
	Duckweed	49.00	$14,563.67	$297.22	Reward/Sonar	0.5 gal/ac / 0.125 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
	Cabomba	4.30	$657.60	$152.93	Hardball	3 gal/ac-5 gal/ac		
	Cutgrass/Water primrose	6.00	$454.50	$75.75	Habitat	0.5 gal/ac		90% control
	Hydrilla	2.00	$976.50	$488.25	Aquathol K	2.5 gal/ac		90% control
	Hydrilla/Phitophera	22.50	$3,948.20	$175.48	Captain	4gal/ac-12 gal/ac		> 95% control
	TOTAL:	206.80	$32,212.77	$155.77				
Horry County	Island Applesnails	110.50	$3,670.50	$33.22	Copper	5 ppm	Eradicate or reduce problematic snail populations to protect human health and sensitive areas	>60% control
	TOTAL:	110.50	$3,670.50	$33.22				
Lake Cunningham	Brazilian Elodea	32.00	$7,472.64	$233.52	Nautique	7 gal/ac	Reduce problem plants to enhance public access, use and water quality.	90% control
	Water lily	3.00	$227.25	$75.75	Habitat	0.250 gal/ac		90% control
	TOTAL:	35.00	$7,699.89	$220.00				
Lake Greenwood	Hydrilla	236.00	$41,133.58	$174.29	Sonar/Aquathol-K/Nautique	4 gal/ac-10 gal/ac 10 lbs/ac	Eradicate hydrilla from site.	> 90% control of Hydrilla. Note: No Eradication of hydrilla. Hydrilla found @ state park
	Naiad	34.00	$7,939.68	$233.52	Nautique	7 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
	TOTAL:	270.00	$49,073.26	$181.75				
Little Pee Dee River	Water hyacinth	3.00	$224.00	$74.67	Clearcast	0.187 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
	TOTAL:	3.00	$224.00	$74.67				
Naval Weapons Station	Phragmites	115.00	$16,386.25	$142.49	Habitat/Clearcast	0.250 gal/ac-0.500 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
	TOTAL:	115.00	$16,386.25	$142.49		\		

Table 2008-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2008

Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
Pee Dee River	Water hyacinth	4.00	$303.00	$75.75	Habitat	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
	TOTAL:	4.00	$303.00	$75.75				
Samworth WMA	Phragmites	10.00	$1,348.00	$134.80	Habitat	0.375 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
	Water hyacinth	80.00	$10,180.00	$127.25	Clearcast	0.250 gal/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	90% control
	TOTAL:	90.00	$11,528.00	$128.09				
Santee Coastal Reserve	Phragmites	400.00	$60,400.00	$151.00	Habitat	0.500 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
	TOTAL:	400.00	$60,400.00	$151.00				
Santee Delta WMA	Phragmites	70.00	$9,395.50	$134.22	Habitat	0.375 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
	TOTAL:	70.00	$9,395.50	$134.22				
Waccamaw River	Water hyacinth	77.75	$6,141.90	$79.00	Habitat/Reward	0.250 gal/ac/0.500 gal/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	
	TOTAL:	77.75	$6,141.90	$79.00				
Santee Cooper Lakes								
Lake Marion	Crested Floating Heart	85.0	$34,685.00	$408.06	Aquathol K Liquid	4.0 - 6.5 gal/ac	Provide access to open water and shoreline areas for public use and prevent spread to other areas of the lake	>90% in shallow coves, < 20% in open water areas
	Giant Cutgrass, Cattail	129.5	$16,946.94	$130.86	Habitat / Touchdown	0.25/0.50 gal/ac	Reduce plant encroachment on lake-front property and public access areas. Restoration of waterfowl habitat.	TBD due to late fall treatment
	Various Brush	2.5	$309.39	$123.76	Touchdown	1.0 gal/ac	Remove plant biomass to allow promote unrestricted water flow in waterfowl pond feedwater ditches	100% control at end of season
	Lyngbya, Pithophora	7.0	$1,235.48	$176.50	Cutrine Ultra	4 - 6 gal/ac	Reduce algal mats to enhance recreational use of water and reduce interference with agricultural irrigation intakes.	85% control of plant at end of season (St. Julien S/D cove dewatered most of season due to drought)
	Water Primrose, Alligatorweed	37.9	$6,353.08	$167.63	Renovate	0.50 gal/ac	Reduce shoreline plant populations to enhance recreation and navigation	>95% control of plant at end of season. Some late season growth noted.
	Water Willow	11.5	$2,144.77	$186.50	Renovate	2.0 gal/ac	Reduce problem plants in residential area where navigation and recreation are adversely affected.	~75% control of plant at end of season
	Taro	0.5	$61.88	$123.76	Touchdown	1.0 gal/ac	Remove plant biomass to allow promote unrestricted water flow in waterfowl pond feedwater ditches	100% control at end of season
	TOTAL:	274	$61,736.54	$225.40				
Lake Moultrie	American Lotus	3.5	$375.15	$107.19	Touchdown	1.0 gal/ac	Reduce problem plants in residential area where recreation are adversely affected.	>95% control of plant at end of season
	Fragrant Water Lily	1.8	$198.04	$110.02	Touchdown	1.0 gal/ac	Reduce problem plants in residential area where recreation are adversely affected.	>95% control of plant at end of season
	Crested Floating Heart	5.4	$2,304.89	$426.83	Aquathol K Liquid	6.5 gal/ac	Remove problem plants adjacent to boat landing to prevent spread to other areas of lake	>95% control of plant at end of season (in canal area only)
	Hydrilla	0.5	$196.34	$392.68	Aquathol Super K Granular	10 lbs/ac ft	Eliminate plant population at residential area to to prevent spread to other areas of lake and other water bodies.	90% control of plant after treatment; area now de-watered
	Lyngbya, Pithophora	0.5	$30.95	$61.90	Cutrine Ultra	4.0 gal/ac	Reduce algal mats in dead-end coves where navigation and recreation are adversely affected.	85% control of plant after treatment; area now de-watered
	Water Primrose, Alligatorweed	27.8	$4,351.58	$156.53	Renovate	0.50 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	>95% control of plant at end of season; some late season growth noted
	Milfoil	1.5	$259.60	$173.07	Renovate	4.0 - 5.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	100% control after treatment; area now de-watered
	Bladderwort	1.0	$210.17	$210.17	Reward	2.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	90% control of plant after treatment; area now de-watered
	TOTAL:	42	$7,926.72	$188.73				
Taw Caw Impoundment	Hydrilla	175.0	$91,542.49	$523.10	Aquathol K Liquid Cutrine Ultra	6 - 8 gal/ac 1.0 - 2.2 gal/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	~75% control of plant in areas treated at the end of season
	Water Primrose, Alligatorweed	14.0	$1,273.89	$90.99	Renovate	.50 gal/ac	Reduce problem plant population to provide public and shoreline access	>95% control of plant in areas treated at end of season
	Pondweed	0.0	$0.00	#DIV/0!	Aquathol K Liquid	5 - 6 gal/ac	Eliminate plant population to provide public access to coves and open water areas and prevent spread to other areas of lake	<50% reduction of plant biomass in areas treated at the end of season.
	Duckweed	0.0	$0.00	#DIV/0!	Reward	1.0 gal/ac	Remove plant to improve access and use of water for property owners and public.	<50% control of plant at the end of the season
	Total:	189.0	$92,816.38	$491.09				

Table 2008-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2008

Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
Potato Creek Impoundment	Hydrilla	120.0	$41,126.54	$342.72	Sonar AS Sonar Q Sonar PR	.025 gal/ac .67 lb/ac 3.0 - 4.0 lbs/ac	Remove non-native vegetation and promote native vegetation dominance as per Santee Cooper / SCDNR agreement	>95% control of plant over entire impoundment at end of season
	American Lotus	14.0	$1,349.88	$96.42	Renovate	.50 gal/ac	Reduce plant population to provide public access and promote growth of beneficial vegetation	>95% control of plant in areas treated at end of season
	Total:	134.0	$42,476.42	$316.99				
Dean Swamp Impoundment	Hydrilla	112.0	$41,560.48	$371.08	Sonar AS Sonar Q Sonar PR	.025 gal/ac .67 lb/ac 3.0 - 4.0 lbs/ac	Remove non-native vegetation and promote native vegetation dominance as per Santee Cooper / SCDNR agreement	>95% control of plant over entire impoundment at end of season
	Water Primrose, Alligatorweed	5.0	$780.85	$156.17	Renovate	.50 gal/ac	Reduce problem plant population to provide public and shoreline access	~90% control of plant in areas treated at end of season
	Lyngbya, Pithophora	56.0	$7,122.06	$127.18	Cutrine-Ultra	5.0 gal/ac	Reduce algal mats to enhance recreational use of water	~85% control of plant in areas treated at the end of season.
	Total:	173.0	$49,463.39	$285.92				
Fountain Lake Impoundment	Water Primrose, Alligatorweed	2.0	$196.99	$98.50	Touchdown Pro	1.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~85% control of plant in areas treated at the end of season.
	Fragrant Water Lily	3.0	$342.13	$114.04	Touchdown Pro	1.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~90% control of plant in areas treated at the end of season.
	Total:	5.0	$539.12	$107.82				
Church Branch Impoundment	Hydrilla	2.0	$880.21	$440.11	Aquathol K Liquid	7.0 gal/ac	Reduce plant population to provide public access to coves and open water areas and prevent spread to other areas of the lake	~90% control of plant in treated area at the end of season
	Water Primrose, Alligatorweed	7.5	$815.54	$108.74	Renovate	0.50 gal/ac	Reduce plant population to provide shoreline access and public access to coves and open water areas	~80% control of plant in treated area at the end of season
	Lyngbya, Pithophora	0.4	$199.10	$497.75	Cutrine-Ultra	4.0 gal/ac	Eliminate plant population to provide residential shoreline access and remove algal accumulation from submersed vegetation prior to treatment	~90% control of plant in treated area at the end of season
	American Lotus	0.5	$44.74	$89.48	Touchdown Pro	1.0 gal/ac	Reduce plant population to provide residential and public access to open water areas	~90% control of plant in treated area at the end of season
	Coontail	0.1	$49.78	$497.80	Reward Cutrine Ultra	2.0 gal/ac 4.0 gal/ac	Reduce plant population to provide residential access	~100% control of plant in treated area at the end of season
	Pondweed	70.0	$29,488.08	$421.26	Aquathol K Liquid	7.0 gal/ac	Reduce plant population to provide residential access and public access to coves and open water areas	~90% control of plant in treated area at the end of season
	Slender Naiad	23.0	$9,035.04	$392.83	Aquathol K Liquid	7.0 gal/ac	Reduce plant population to provide residential access and public access to coves and open water areas	~90% control of plant in treated area at the end of season
	Total:	103.5	$40,472.49	$391.04				
	Santee Cooper TOTAL:	920.40	$295,431.06	$320.98				
SC State Parks								
Barnwell	Water lily	5.00	$1,005.00	$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Charlestown Landing	Pennywort	0.50	$86.63	$173.26	Clearcast	0.750 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Cheraw	Watershield, milfoil	4.00	$804.00	$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Goodale	Water lily	2.00	$402.00	$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
H Cooper Black	Spatterdock	1.00	$201.00	$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Huntington Beach	Phragmites	0.250	$32.38	$129.52	Clearcast	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Kings Mountain	Naiads	4.00	$1,120.00	$280.00	Aquathol K	4 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Little Pee Dee	Yellow cowlily	10.00	$2,010.00	$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Poinsette	Spatterdock	5.00	$1,005.00	$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Sesquicentennial	Water lily	4.00	$804.00	$201.00	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
Sesquicentennial	Water lily	1.00	$234.75	$234.75	Hardball/Habitat	5 gal/ac 0.250 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
	TOTAL:	36.75	$7,704.76	$209.65				
	SCDNR TOTAL	2366.24	$337,557.23	$142.66				
	SANTEE COOPER TOTAL	920.40	$295,431.06	$320.98				
	STATE PARKS TOTAL	36.75	$7,704.76	$209.65				
	GRAND TOTAL	3323.39	$640,693.05	$192.78				

Table 2009-A. Summary of Expenditures by Source for Control Operations During 2009.

	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	Back River Reservoir	$54,785	$27,393	$27,393	$0	SCE&G, CPW
2	Baruch	$4,823	$2,412	$2,412	$0	Baruch
3	Black Mingo Creek	$68	$34	$34	$0	Georgetown Co.
4	Black River	$109	$55	$55	$0	Georgetown Co.
5	Bonneau Ferry WMA	$9,505	$4,753	$4,753	$0	SCDNR
6	Boyd Pond	$1,663	$832	$832	$0	Aiken County
7	Caw Caw Park	$570	$285	$285	$0	Charleston Parks
8	Cooper River	$14,435	$7,218	$7,218	$0	Berkeley Co.
9	Dungannon WMA	$686	$343	$343	$0	SCDNR, USF&W
10	Georgetown Parks	$8,271	$4,136	$4,136	$0	Georgetown Co.
11	Goose Creek Reservoir	$47,506	$23,753	$23,753	$0	CPW
12	Horry County	$8,747	$4,374	$4,374	$0	SCDNR
13	Lake Cunningham	$5,728	$2,864	$2,864	$0	Greer CPW
14	Lake Greenwood	$33,353	$16,677	$16,677	$0	Greenwood Co.
15	Lake Thicketty	$682	$341	$341	$0	SCE&G, Lexington Co.
16	Pee Dee River	$719	$360	$360	$0	Georgetown Co.
17	Samworth WMA	$5,031	$2,516	$2,516	$0	SCDNR
18	Santee Coastal Reserve	$51,025	$25,513	$25,513	$0	SCDNR
19	US Naval Weapons Sta.	$14,803	$0	$2,803	$12,000	US Navy
20	Waccamaw River	$1,074	$537	$537	$0	USF&W
21	Yawkey	$9,813	$4,907	$4,907	$0	SCDNR
	State Parks					
22	Barnwell SP	$335.00	$168	$168	$0	SCPRT
23	Charlestown Landing SP	$2,294.00	$1,147	$1,147	$0	SCPRT
24	Goodale SP	$445.00	$223	$223	$0	SCPRT
25	H Cooper Black SP	$0.00	$0	$0	$0	SCPRT
26	Huntington Beach SP	$663.00	$332	$332	$0	SCPRT
27	Kings Mountain SP	$1,172.00	$586	$586	$0	SCPRT
28	Little Pee Dee SP	$2,218.00	$1,109	$1,109	$0	SCPRT
29	Sesquicentennial SP	$665.00	$333	$333	$0	SCPRT
	Santee Cooper Lakes					
30	Lake Marion	$193,722	$136,222	$57,500	$0	Santee Cooper
31	Lake Moultrie	$17,121	$17,121	$0	$0	Santee Cooper
32	Sub Impondments	$85,505	$85,505	$0	$0	Santee Cooper
	SCDNR Total	$273,396	$129,297	$132,100	$12,000	
	State Park Lake Total	$7,792	$3,896	$3,896	$0	
	Santee Cooper Total	$296,348	$238,848	$57,500	$0	
	Grand Total	$572,587	$373,461	$194,915	$12,000	

Table 2009-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2009

	Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
1	**Back River Reservoir**	Hydrilla	129.00	$40,774.94	$316.08	Komeen/Komeen-Reward /Nautique	16 gal/ac/4 gal/ac-2gal/ac/10 gal/ac	Reduce problem plants to enhance public access, use, water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control Reward/Komeen mix proved to be more effective
		Water hyacinth	54.00	$4,783.25	$88.58	Reward/Habitat/Habitat-Glyphosate	0.250 - 0.500 gal/ac		90% control
		Water primrose	103.00	$9,226.51	$89.58	Renovate/Habitat/Habitat-Clearcast	0.250 - 0.750 gal/ac		90% control
		TOTAL:	286.00	$54,784.70	$191.55				
2	**Baruch Institute (Winyah Bay)**	Phragmites	22.00	$4,822.60	$219.21	Clearcast	0.750 - 1 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 90% control
		TOTAL:	22.00	$4,822.60	$219.21				
3	**Black River**	Alligatorweed, Pennywort	3.00	$108.78	$36.26	Habitat/Habitat-Clearcast	0.250 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	> 95% control
		TOTAL:	3.00	$108.78	$36.26				
4	**Black Mingo Creek**	Alligatorweed, Pennywort	2.00	$67.50	$33.75	Habitat	0.25	Reduce problem plants to enhance waterfowl habitat, public access and use.	> 95% control
		TOTAL:	2.00	$67.50	$33.75				
5	**Bonneau Ferry Misc Ponds & Reserves**	Water Primrose, Water hyacinth, Frog's bit, Lotus, Cutgrass,	62.25	$9,505.25	$152.69	Habitat/Clearcast/Galleon/ Glyphosate	0.156 - 0.500 gal/ac 3 gal/ac - 5gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	> 60% control > 90% control
		TOTAL:	62.25	$9,505.25	$152.69				
6	**Boyd Pond**	Watermilfoil	7.00	$1,552.25	$221.75	Hardball	5 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	> 90% control
		Torpedo grass	1.00	$110.50	$110.50	Habitat	0.250 gal/ac		> 90% control
		TOTAL:	8.00	$1,662.75	$207.84				
7	**Caw Caw Natural Area**	Phragmites, Tallow	4.00	$569.50	$142.38	Habitat/Clearcast	0.500 - 0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public	> 90% control
		TOTAL:	4.00	$569.50	$573.50				
8	**Cooper River**	Hydrilla	31.05	$10,540.82	$339.48	Komeen/Nautique	10 - 16 gals/ac	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control
		Water hyacinth	21.00	$1,525.75	$72.65	Habitat	0.250 gal/ac		> 95% control
		Water primrose	20.00	$2,368.25	$118.41	Habitat/Clearcast/Glyphosate	0.125 - 0.500 gal/ac		> 90% control
		TOTAL:	72.05	$14,434.82	$200.34				
9	**Georgetown Parks**	Phragmites	19.00	$4,014.50	$211.29	Habitat/Clearcast	0.500 - 0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
		TOTAL:	19.00	$4,014.50	$211.29				
10	**Goose Creek Reservoir**	Water hyacinth	9.00	$825.75	$91.75	Clearcast/Reward	0.250 gal/ac	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control
		Water lettuce	166.00	$15,270.40	$91.99	Habitat/Reward/Galleon/ Glyphosate	0.125 - 0.500 gal/ac		> 80% control
		Duckweed	24.50	$4,139.27	$168.95	Habitat/Reward/Galleon/	0.039 -0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
		Algae, Torpedo grass	11.00	$1,055.75	$95.98	Captain/Habitat/Glyphosate	0.500 - 2 gal/ac		
		Water primrose	74.00	$7,031.15	$95.02	Clearcast/Habitat	0.250 - 0.500 gal/ac		90% control
		Hydrilla	157.00	$17,764.00	$113.15	Aquathol K/Captain/Triploid Grass Carp	5 - 6 gal/ac / 15 per veg/ac		50% control
		Hygrophila	3.50	$1,419.25	$405.50	Clearcast/Aquathol K	1 - 12.5 gal/ac		> 95% control
		TOTAL:	445.00	$47,505.57	$106.75				
11	**Horry County**	Island Applesnails	54.40	$8,746.78	$160.79	Copper, Hydrothol 191	0.250 - 5.390 gal/ac	Eradicate or reduce problematic snail populations to protect human health and sensitive areas	> 90% control
		TOTAL:	54.40	$8,746.78	$160.79				
12	**Lake Cunningham**	Brazilian Elodea	45.00	$4,603.50	$102.30	Triploid Grass Carp	15 per veg/ac	Reduce problem plants to enhance public access, use and water quality.	90% control
		Spatterdock	8.00	$1,124.00	$140.50	Clearcast	0.500 gal/ac		90% control
		TOTAL:	53.00	$5,727.50	$108.07				
13	**Lake Greenwood**	Hydrilla	243.00	$30,016.56	$123.52	Triploid Grass Carp/ Nautique/Aquathol K	15 per veg/ac / up to 7 gal/ac	Eradicate hydrilla from site.	> 90% control of Hydrilla in upper lake. Hydrilla expands.
		Naiad	16.00	$3,336.46	$208.53	Nautique	up to 7 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
		TOTAL:	259.00	$33,353.02	$128.78				
14	**Lake Thicketty**	Hydrilla	5.00	$682.00	$136.40	Triploid Grass Carp	15 per veg/ac	Eradicate hydrilla from site.	90% control
		TOTAL:	5.00	$682.00	$5.00				
15	**Naval Weapons Station**	Phragmites	72.00	$13,627.25	$189.27	Habitat/Clearcast	0.500 - 0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
		Cattails, Misc	14.00	$1,175.75	$83.98	Habitat	0.250 - 0.375 gal/ac		
		TOTAL:	86.00	$14,803.00	$172.13		\		
16	**Pee Dee River**	Water hyacinth	5.00	$718.75	$143.75	Clearcast	0.250 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
		TOTAL:	5.00	$718.75	$143.75				
17	**Samworth WMA**	Water hyacinth	35.00	$5,031.25	$143.75	Clearcast	0.250 gal/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	90% control
		TOTAL:	35.00	$5,031.25	$143.75				
18	**Santee Coastal Reserve**	Phragmites	260.00	$51,025.00	$196.25	Habitat	0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
		TOTAL:	260.00	$51,025.00	$196.25				
19	**Waccamaw River**	Water hyacinth	14.00	$1,074.50	$76.75	Habitat	0.250 gal/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	90% control
		TOTAL:	14.00	$1,074.50	$196.25				

Table 2009-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2009

	Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
20	Yawkey	Phragmites	50.00	$9,812.50	$196.25	Habitat	0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
		TOTAL:	50.00	$9,812.50	$196.25				
Santee Cooper Lakes									
21	Lake Marion	Crested Floating Heart	511.0	$166,449.95	$325.73	Aquathol K Liquid Clearcast / Touchdown PRO	2.5 - 7.0 gal/ac 1.0 gal/ac / 1.0 gal/ac	Provide access to open water and shoreline areas for public use and prevent spread to other areas of the lake	> 95% in shallow coves with Aquathol K 80% in open water areas with Clearcast / Touchdown PRO
		Chara	0.8	$150.46	$188.08	Cutrine Ultra	4.0 - 6.0 gal/ac	Reduce problem plants in residential area where navigation and recreation is adversely affected.	> 95% control of plant at end of season
		Giant Cutgrass, Cattail	59.0	$5,529.24	$93.72	Habitat / Touchdown PRO	0.25 gal/ac/0.50 gal/ac	Reduce plant encroachment on lake-front property and public access areas. Restoration of waterfowl habitat.	100% control of plant at end of season
		Lyngbya, Pithophora	19.3	$2,769.64	$143.50	Cutrine Ultra	4.0 - 6.0 gal/ac	Reduce algal mats to enhance recreational use of water and reduce interference with agricultural irrigation intakes.	90% control of plant at end of season
		Water Hyacinth	26.6	$3,278.54	$123.72	Reward, Renovate 3, Clearcast	0.5 gal/ac, 0.5 gal/ac, .125 gal/ac	Remove non-native, invasive plant population to prevent spread to other areas of the lake	> 95% control of plants after treatment
		Water Primrose, Alligatorweed	115.8	$13,465.61	$116.28	Touchdown PRO, Renovate 3	1.0 gal/ac, .5 gal/ac	Reduce shoreline plant populations to enhance recreation and navigation	~ 75% control of plant at end of season. Late season regrowth.
		Water Willow	6.3	$1,258.74	$199.80	Renovate 3	1.0 gal/ac	Reduce problem plants in residential area where navigation and recreation is adversely affected.	~ 85% control of plant at end of season
		Pondweed	0.5	$184.96	$369.92	Reward, Cutrine Ultra	2.0 gal/ac / 3.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	~ 75% control of plant at end of season
		Water Pod	1.5	$254.95	$169.97	Touchdown PRO	1.0 gal/ac	Reduce problem plants in residential area where navigation and recreation is adversely affected.	~ 75% control of plant at end of season
		Duckweed	1.5	$379.46	$252.97	Reward	1.0 gal/ac	Reduce plant population to prevent spread to other quiescent areas of the lake	90% control of plant at end of season
		Total:	742.2	$193,721.55	$261.01				
22	Lake Moultrie	American Lotus	2.0	$393.42	$196.71	Touchdown PRO	1.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected	> 95% control of plant at end of season
		Fragrant Water Lily	1.0	$109.28	$109.28	Touchdown PRO	1.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected	> 95% control of plant at end of season
		Giant Cutgrass, Cattail	3.3	$387.89	$119.35	Habitat / Touchdown PRO	0.25 gal/ac/0.50 gal/ac	Reduce problem plants in residential area where recreation is adversely affected	100% control of plant at the end of season
		Hydrilla	20.0	$6,400.18	$320.01	Aquathol K Liquid	5.0 gal/ac	Eliminate plant population incove to prevent spread of plant to other areas of lake	90% control of plant after treatment
		Lyngbya, Pithophora	0.2	$35.15	$175.75	Cutrine Ultra	4.0 - 6.0 gal/ac	Reduce algal mats in dead-end coves where navigation and recreation is adversely affected	85% control of plant after treatment
		Water Primrose, Alligatorweed	71.8	$9,263.08	$129.10	Touchdown PRO, Renovate 3	1.0 gal/ac, .5 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	~ 75% control of plant at end of season. Some late season regrowth noted.
		Water Willow	5.0	$478.07	$95.61	Renovate 3	1.0 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	90% control of plant at end of season
		Soft Rush	0.5	$53.71	$107.42	Touchdown PRO	1.0 gal/ac	Reduce plant population to prevent spread to other quiescent areas of the lake	100% control of plant after treatment
		TOTAL:	103.7	$17,120.78	$165.10	/acre			
	Taw Caw Impoundment	Cabomba	20.0	$8,372.20	$418.61	Sonar AS, Q, PR	.05 gal/ac 1.5 - 2.0 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	100% control of plant at the end of season.
		Hydrilla	80.0	$43,143.67	$539.30	Sonar AS, Q, PR	.05 gal/ac 1.5 - 2.0 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	> 95% control of plant at the end of season
		Water Primrose, Alligatorweed	17.0	$1,696.93	$99.82	Touchdown Pro	1.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~ 75% control of plant at end of season. Late season regrowth.
		Total:	117.0	$53,212.80	$454.81	$454.81			
	Dean Swamp Impoundment	Water Primrose, Alligatorweed	9.0	$1,127.44	$125.27	Touchdown Pro	1.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~75% control of plant at end of season. Late season regrowth.
		Lyngbya, Pithophora	9.5	$1,210.50	$127.42	Cutrine-Ultra	3.5 - 6.0 gal/ac	Reduce algal mats to enhance recreational use of water	~85% control of plant in areas treated at the end of season.
		Total:	18.5	$2,337.94	$126.38	$126.38			
	Fountain Lake Impoundment	Water Primrose, Alligatorweed	10.5	$1,074.59	$102.34	Touchdown Pro	1.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~75% control of plant at end of season. Late season regrowth.
		Total:	10.5	$1,074.59	$102.34	$102.34			
	Church Branch Impoundment	Water Primrose, Alligatorweed	3.0	$548.56	$182.85	Touchdown Pro	1.0 gal/ac	Reduce plant population to provide shoreline access and public access to coves and open water areas	~ 75% control of plant at end of season. Late season regrowth.
		Lyngbya, Pithophora, Spirogyra	43.0	$6,430.88	$149.55	Cutrine-Ultra	5.0 - 7.0 gal/ac	Eliminate algae to provide residential shoreline access	~ 90% control of plant in treated area at the end of season
		Pondweed	30.0	$13,140.43	$438.01	Aquathol K Liquid	7.0 gal/ac	Reduce plant population to provide residential access and public access to coves and open water areas	~ 90% control of plant in treated area at the end of season

Table 2009-B Summary of S. C. Aquatic Plant Management Control Operations and Expenditures During 2009									
	Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
		Slender Naiad	20.0	$8,760.29	$438.01	Aquathol K Liquid	7.0 gal/ac	Reduce plant population to provide residential access and public access to coves and open water areas	~ 90% control of plant in treated area at the end of season
		TOTAL:	96.0	$28,880.14	$300.83				
		Impoundments TOTAL:	**242.0**	**$85,505.47**	**$353.33**				
		Santee Cooper TOTAL:	**1087.90**	**$296,347.80**	**$272.40**				
SC State Parks									
23	Barnwell	Water lily	2.00	$264.75	$132.38	Hardball	2.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
		Cattails, Misc	0.50	$70.25	$140.50	Clearcast	0.500 gal/ac		95% control
24	Charlestown Landing	Algae	7.00	$2,293.00	$327.57	Phycomycin/Copper	0.750 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
25	Goodale	Water lily	2.00	$443.50	$221.75	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
26	H Cooper Black	Spatterdock	0.00	$0.00	#DIV/0!	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
27	Huntington Beach	Cattails, phragmites	6.000	$663.00	$110.50	Habitat	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
28	Kings Mountain	Naiads	4.00	$1,172.00	$293.00	Aquathol K	4 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
29	Little Pee Dee	Yellow cowlily	10.00	$2,217.50	$221.75	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
30	Sesquicentennial	Water lily	3.00	$666.25	$221.75	Hardball	5 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
		TOTAL:	34.50	$7,789.25	$225.78				
		SCDNR TOTAL	1744.70	$268,450.27	$153.87				
		SANTEE COOPER TOTAL	1087.90	$296,347.80	$272.40				
		STATE PARKS TOTAL	34.50	$7,789.25	$225.78				
		GRAND TOTAL	2867.10	$572,587.32	$199.71				

Table 2010-A. Summary of Expenditures by Source for Control Operations During 2010.

	Water Body Name	Total Cost	Local	State	Federal	Local Sponsor
1	ACE Basin	$3,989	$1,995	$1,994	$0	SCDNR, USF&W
2	Back River Reservoir	$45,967	$22,984	$22,983	$0	SCE&G, CPW
3	Black River	$636	$318	$318	$0	Georgetown Co.
4	Black Mingo Creek	$445	$223	$222	$0	Georgetown Co.
5	Bonneau Ferry WMA	$8,939	$5,739	$3,200	$0	SCDNR
6	Caw Caw Park	$329	$165	$164	$0	Charleston Parks
7	Cooper River	$15,955	$7,978	$7,977	$0	Berkeley Co.
8	Donnelley	$10,918	$4,400	$6,518	$0	SCDNR
9	Dungannon WMA	$1,765	$0	$1,765	$0	SCDNR, USF&W (exp)
10	Durham Canal	$281	$141	$140	$0	
11	Georgetown Parks	$4,770	$2,385	$2,385	$0	Georgetown Co.
12	Goose Creek Reservoir	$31,322	$15,661	$15,661	$0	CPW
13	Horry County	$18,610	$0	$18,610	$0	SCDNR(IAS)
14	Lake Cunningham	$2,042	$1,021	$1,021	$0	Greer CPW
15	Lake Greenwood	$17,541	$8,771	$8,770	$0	Greenwood Co.
16	Lake Moultrie (Carp Only)	$28,020	$0	$28,020	$0	Note(SCDNR Carp Stocking)
17	Lexington County	$0	$0	$0	$0	Experimental(No costs)
18	Santee Coastal Reserve	$43,084	$21,542	$21,542	$0	SCDNR
19	Santee Delta	$13,725	$13,725	$0	$0	SCDNR
20	US Naval Weapons Sta.	$7,914	$0	$7,914		US Navy
21	Waccamaw River	$696	$348	$348	$0	Georgetown Co.
22	Yawkey	$9,198	$4,599	$4,599	$0	SCDNR
	Santee Cooper Lakes					
23	Lake Marion	$421,997	$421,997	$0	$0	Santee Cooper
24	Lake Moultrie	$159,297	$159,297	$0	$0	Santee Cooper
	Sub Impondments	$19,167	$19,167	$0	$0	Santee Cooper
	State Parks					
25	Barnwell SP	$2,193	$1,097	$1,096	$0	SCPRT
26	Charlestown Landing SP	$86	$43	$43	$0	SCPRT
27	Little Pee Dee SP	$260	$130	$130	$0	SCPRT
28	Sesquicentennial SP	$2,320	$1,160	$1,160	$0	SCPRT
	SCDNR Total	$266,146	$111,995	$154,151	$0	
	State Park Lake Total	$4,859	$2,430	$2,429	$0	
			42%	58%		
	Santee Cooper Total	$785,621	$785,621	$0	$0	
	Grand Total	$1,056,626	$900,046	$156,580	$0	
			85%	15%		

Table 2010-B Summary of S.C. Aquatic Nuisance Species Control Operations and Expenditures During 2010

	Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
1	**Ace Basin**	Phragmites	10.00	$1,175.01	$117.50	Habitat/Glyphosate	0.750 gal/ac-0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
		Sesbania	41.00	$2,813.63	$68.63	Hardball	0.125 gal/ac		
		TOTAL:	51.00	$3,988.64	$78.21				
2	**Back River Reservoir**	Hydrilla	124.94	$27,530.56	$220.35	Komeen/Komeen-Reward	16 gal/ac/4 gal/ac-2gal/ac	Reduce problem plants to enhance public access, use, water quality, and maintain electric power generation and minimize impacts to water intakes.	> 95% control Reward/Komeen mix proved to be more effective
		Water hyacinth	252.00	$16,899.67	$67.06	Renovate/Reward/ Habitat/Glyphosate	0.250 - 0.500 gal/ac		90% control
		Water primrose	20.00	$1,536.57	$76.83	Renovate/Habitat/Glyphosate	0.250 - 0.500 gal/ac		90% control
		TOTAL:	396.94	$45,966.80	$115.80				
3	**Black River**	Alligatorweed, Pennywort	10.00	$636.25	$63.63	Habitat	0.500 gal/ac	Reduce problem plants to enhance waterfowl habitat,	> 95% control
		TOTAL:	10.00	$636.25	$63.63				
4	**Black Mingo Creek**	Alligatorweed, Pennywort	7.00	$445.38	$63.63	Habitat	0.500 gal/ac	Reduce problem plants to enhance waterfowl habitat,	> 95% control
		TOTAL:	7.00	$445.38	$63.63				
5	**Bonneau Ferry Misc Ponds & Reserves**	Water Primrose, Water hyacinth, Frog's bit, Lotus, Cutgrass, Cattails	64.00	$6,400.00	$100.00	Habitat/Glyphosate	0.500gal/ac - 0.500gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	>60% control
		Sesbania	37.00	$2,539.13	$68.63	Hardball	0.125 gal/ac		>90% control
		TOTAL:	101.00	$8,939.13	$88.51				
6	**Caw Caw Natural Area**	Phragmites	2.50	$201.10	$80.44	Habitat	0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat,	>90% control
			1.00	$127.80	$127.80	Clearcast	0.375 gal/ac	Reduce problem plants to enhance waterfowl habitat,	>95% control
		TOTAL:	3.50	$328.90	$93.97				
7	**Cooper River**	Hydrilla	38.49	$11,239.11	$292.00	Komeen/Nautique/Reward	16 gal/ac/10 gal/ac/4 gal/ac/ 4 gal/ac	Provide boat trails to main channel through hydrilla. Reduce problem plants to enhance public access and use.	> 95% control
		Water hyacinth	66.00	$3,531.02	$53.50	Habitat/Glyphosate	0.250 gal/ac-0.250 gal/ac		> 95% control
		Water primrose	17.00	$1,185.75	$69.75	Habitat/Clearcast/Glyphosate	0.250 gal/ac-0.500 gal/ac		> 95% control
		TOTAL:	121.49	$15,955.88	$131.33				
8	**Donnelley**	Frog's bit, Cutgrass, water primrose, Alligatorweed	108.00	$10,918.00	$101.09	Habitat/Glyphosate/ Galleon	0.500 gal/ac/ 0.500 gal/ac/ 0.060 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control
		TOTAL:	108.00	$10,918.00	$101.09				
9	**Dungannon**	Frog's bit, Cutgrass, water primrose, Alligatorweed	11.00	$1,765.00	$160.45	Galleon	0.141 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	90% control
		TOTAL:	11.00	$1,765.00	$160.45				
10	**Durham Canal**	Water primrose	5.00	$281.32	$56.26	Habitat/Glyphosate	0.250 gal/ac-0.500 gal/ac	Reduce problem plants to enhance habitat, public access, water withdrawal, and use.	90% control
		TOTAL:	5.00	$281.32	$56.26				
11	**Georgetown Parks**	Phragmites	39.33	$4,769.71	$121.27	Habitat/Clearcast/Glyphosate	0.500 gal/ac - 0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
		TOTAL:	39.33	$4,769.71	$121.27				
12	**Goose Creek Reservoir**	Water hyacinth, Water lettuce	122.00	$8,332.89	$68.30	Habitat/Clearcast/Reward/ Galleon/Glyphosate	0.1875 gal/ac-0.750 gal/ac	Reduce water hyacinth & water lettuce to greatest extent possible.	> 95% control
		Duckweed	36.50	$9,985.49	$273.58	Reward/Sonar/Galleon	0.0938 gal/ac - 0.296 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
		Water lily	6.00	$771.00	$128.50	Clearcast	0.500 gal/ac		
		Water primrose	86.50	$6,139.76	$70.98	Habitat	0.5 gal/ac		90% control
		Hydrilla	0.00	$4,062.90		Triploid Grass Carp	870		90% control
		Hygrophila	5.00	$2,030.00	$406.00	Clearcast	2 gal/ac		> 80% control
		TOTAL:	256.00	$31,322.04	$122.35				
13	**Horry County**	Island Applesnails	206.96	$18,609.79	$89.92	Copper	up to 5 ppm	Eradicate or reduce problematic snail populations to protect human health and sensitive areas	>60% control
		TOTAL:	206.96	$18,609.79	$89.92				
14	**Lake Cunningham**	Brazilian Elodea	0.00	$1,008.72		Triploid Grass Carp	216	Reduce problem plants to enhance public access, use and water quality.	90% control
		Lotus, spatterdock	9.00	$1,033.00	$114.78	Habitat	0.250 gal/ac		90% control
		TOTAL:	9.00	$2,041.72	$226.86				
15	**Lake Greenwood**	Hydrilla, naiad	0.00	$17,540.52		Triploid Grass Carp	3756	Reduce problem plants to enhance public access, use and water quality. Eradicate hydrilla from site.	100% control of Hydrilla.
		TOTAL:	0.00	$17,540.52					
16	**Lake Moultrie(Grass Carp)**	Hydrilla		$28,020.00		Triploid Grass Carp	6000	Reduce problem plants to enhance public access, use and water quality.	> 50% control
		TOTAL:	0.00	$28,020.00					

	Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
17	**Lexington County**	Nymphoides Peltata	0.50	$0.00	$0.00	Clearcast/ Renovate/Galleon	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	> 95% control
		TOTAL:	0.50	$0.00	$0.00				
18	**Santee Coastal Reserve**	Phragmites	366.67	$43,083.55	$117.50	Habitat/Glyphosate	0.750 gal/ac/0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control
		TOTAL:	366.67	$43,083.55	$117.50				
19	**Santee Delta WMA**	Sesbania	200.00	$13,725.00	$68.63	Hardball	0.125 gal/ac	Reduce problem plants to enhance waterfowl habitat, public access and use.	95% control
		TOTAL:	200.00	$13,725.00	$68.63				
20	**US Naval Weapons Station**	Phragmites	75.00	$7,913.75	$105.52	Habitat/Glyphosate	0.500 gal/ac-0.750 gal/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	> 95% control
		TOTAL:	75.00	$7,913.75	$105.52		\		
21	**Waccamaw River**	Water hyacinth	13.00	$695.51	$53.50	Habitat/Glyphosate	0.250 gal/ac/0.250 gal/ac	Reduce hyacinth to minimize spread and impacts to public access and use.	95% control
		TOTAL:	13.00	$695.51	$53.50				
22	**Yawkey**	Phragmites, cattails	82.00	$9,197.51	$112.16	Habitat/Glyphosate	0.250 gal/ac-0.750 gal/ac	Reduce phragmites and problem plants to enhance waterfowl habitat, public access and use.	>90% control
		TOTAL:	82.00 2063.39	$9,197.51 $266,144.40	$112.16 $128.98				
	Santee Cooper Lakes								
23	**Lake Marion**	Crested Floating Heart	1202.0	$354,272.81	$294.74	Aquathol K Liquid Clearcast, Touchdown PRO	2.5 - 7.0 gal/ac 1.0 gal/ac / 0.5 gal/ac	Provide access to open water and shoreline areas for public use and prevent spread to other areas of the lake	>95% in shallow coves with Aquathol K 80% in open water areas with Clearcast / Touchdown PRO Some regrowth noted @ end of season
		Chara	12.8	$2,531.68	$197.79	Captain, Cygnet Plus	4.0 - 5.0 gal/ac	Reduce problem plants in residential area where navigation and recreation is adversely affected.	>95% control of plant at end of season
		Giant Cutgrass, Cattail	8.0	$799.68	$99.96	Habitat, Touchdown PRO	0.25 gal/ac 0.50 gal/ac	Reduce plant encroachment on lake-front property and public access areas. Restoration of waterfowl habitat.	100% control of plant at end of season
		Hydrilla	78.0	$32,327.37	$414.45	Aquathol K Liquid, Nautique	6.0 - 8.0 gal/ac 1.0 gal/ac	Reduce problem plant population to prevent spread to other areas of the lake. Maintain level until adequate grass carp population from restocking can maintain control	>90% control of plant after treatment
		Lyngbya, Pithophora	31.3	$5,670.53	$181.17	Captain, Cygnet Plus	4.0 - 6.0 gal/ac 0.5 gal/ac	Reduce algal mats to enhance recreational use of water	90% control of plant at end of season
		Water Hyacinth	10.0	$1,763.91	$176.39	Reward, Renovate 3, Clearcast	0.5 gal/ac, 0.5 gal/ac, .125 gal/ac	Remove non-native, invasive plant population to prevent spread to other areas of the lake	>95% control of plants after treatment
		Water Primrose, Alligatorweed	85.0	$18,682.36	$219.79	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce shoreline plant populations to enhance recreation and navigation	~75% control of plant at end of season. Some late season regrowth noted.
		Water Willow	11.5	$1,448.45	$125.95	Renovate 3	.375 gal/ac	Reduce problem plants in residential areas where navigation and recreation is adversely affected.	~85% control of plant at end of season
		Pondweed	9.1	$4,103.31	$450.91	Aquathol K, Captain	5.0 - 9.0 gal/ac, 0.95 gal/ac	Reduce problem plants in residential areas where navigation and recreation is adversely affected.	~75% control of plant at end of season
		Water Pod	3.0	$396.40	$132.13	Renovate 3	.375 gal/ac	Reduce problem plants in residential areas where navigation and recreation is adversely affected	~75% control of plant at end of season
		TOTAL:	1451	$421,996.50	$290.89				
24	**Lake Moultrie**	American Lotus	2.1	$282.88	$134.70	Renovate	0.5 - 0.75 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	>95% control of plant at end of season
		Cabomba	5.3	$2,782.29	$524.96	Sonar Q, Sonar PR	19.5 lbs/ac,	Reduce problem plants in residential areas where recreation is adversely affected	100% control of plant after treatment
		Hydrilla	287.0	$144,772.80	$504.43	Aquathol K Liquid, Nautique, Captain	7.5 - 10.0 gal/ac 1.0 gal/ac	Reduce problem plant population to prevent spread to other areas of the lake. Maintain level until adequate grass carp population from restocking can maintain control	90% control of plant after treatment

Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
	Lyngbya, Pithophora	1.3	$385.70	$296.69	Captain, Cygnet Plus	4.0 - 6.0 gal/ac	Reduce algal mats on shoreline and in dead-end coves where navigation and recreation is adversely affected	85% control of plant after treatment
	Water Primrose, Alligatorweed	48.5	$8,708.82	$179.56	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	~75% control of plant at end of season. Some late season regrowth noted.
	Water Willow	0.1	$25.39	$253.90	Renovate 3	.375 gal/ac	Reduce problem plants in residential areas where recreation is adversely affected	90% control of plant at end of season
	Pondweed	0.2	$50.78	$253.90	Reward, Cutrine Ultra	2.0 gal/ac, 4.0 gal/ac	Reduce problem plants in residential area where recreation are adversely affected.	80% control after treatment
	Parrotsfeather	1.0	$231.86	$231.86	Renovate 3	1.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	100% control after treatment
	Big Floating Heart	4.0	$1,121.97	$280.49	Clearcast, Touchdown PRO	1.0 gal/ac, .5 gal/ac	Reduce plant population to prevent spread to other quiescent areas of the lake	100% control of plant after treatment
	Milfoil	2	$934.68	$467.34	Renovate 3	2.0 - 5.0 gal/ac	Reduce problem plants in residential area where recreation is adversely affected.	90% control of plant at end of season
	TOTAL:	352	$159,297.17	$453.19				
Taw Caw Impoundment	Hydrilla	171.0	$19,493.98	$114.00	Sonar One	4.2 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	>95% control of plant at the end of season
	Water Primrose, Alligatorweed	7.0	$1,338.81	$191.26	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~75% control of plant at end of season. Some late season regrowth noted.
	Total:	178.0	$20,832.79	$117.04				
Potato Creek Impoundment	Hydrilla	145.0	$78,188.41	$539.23	Sonar Q, PR	7.2 - 4.9 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	>95% control of plant at the end of season
	Lyngbya, Pithophora	40.0	$4,450.55	$111.26	Captain, Cygnet Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water and improve uptake of fluridone into plant	>80% control in areas treated at the end of season
	Total:	185.0	$82,638.96	$446.70				
Dean Swamp Impoundment	Hydrilla	116.0	$66,610.93	$574.23	Sonar Q, PR	8.3 - 5.7 lbs/ac	Reduce plant population to provide public access to shoreline, coves and open water areas and prevent spread of plant to other areas of the lake	>95% control of plant at the end of season
	Water Primrose, Alligatorweed	12.0	$2,157.70	$179.81	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~85% control of plant at end of season. Some late season regrowth noted.
	Lyngbya, Pithophora	59.0	$7,523.55	$127.52	Captain, Cygnet Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	~75% control of algal mats at end of season.
	Total:	187.0	$76,292.18	$407.98				
Fountain Lake Impoundment	Chara	3	$608.57	$202.86	Captain, Cygnet Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	>95% control of plant in areas treated at end of season
	Water Primrose, Alligatorweed	4.5	$1,009.46	$224.32	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~75% control of plant at end of season. Some late season regrowth noted.
	Fragrant Water Lily	2	$339.51	$169.76	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Provide access to open water and shoreline areas for public use	>95% control of plant in areas treated at end of season
	Lyngbya, Pithophora	4	$856.68	$214.17	Captain, Cygnet Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	Remove algae to improve access and use of water for property owners.
	Pondweed	5	$1,872.01	$374.40	Aquathol K Liquid	5 - 6 gal/ac	Eliminate plant population to provide public access to coves and open water areas and prevent spread to other areas of lake	~75% control of plant at end of season. Some late season regrowth noted.
	Water Shield	3.5	$507.14	$144.90	Glyphosate	.75 gal/ac	Provide access to open water and shoreline areas for public use	>95% control of plant in areas treated at end of season
	Spirogyra	1	$202.86	$202.86	Captain, Cygnet Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	>95% control of algae in areas treated at end of season
	Total:	23.0	$5,396.23	$234.62				
Church Branch Impoundment	Water Primrose, Alligatorweed	6.0	$870.67	$145.11	Clearcast, Touchdown PRO	.5 gal/ac, .25 gal/ac	Reduce problem plant population to provide public and shoreline access	~90% control of plant at end of season. Some late season regrowth noted.

	Waterbody	TargetPlants	Acres	TotalCost	Cost/Acre	ControlAgent	Rate	ManagementObjective	ControlEffectiveness
		Spirogyra, Pithophora	0.3	$224.11	$747.03	Captain, Cygnet Plus	4.0 gal/ac, 1.0 gal/ac	Remove algae to improve access and use of water for property owners.	~75% control of plant at end of season. Some late season regrowth noted.
		Pondweed	55.3	$17,984.30	$325.21	Reward, Captain	2.0 gal/ac, 5.0 gal/ac	Reduce problem plant population to provide public and shoreline access	~70% control of plant at end of season. Some late season regrowth noted.
		Water Shield	1	$88.12	$88.12	Refuge	.75 gal/ac	Remove plants to improve access and use of water for property owners.	>95% control of plant in areas treated at end of season
		Total:	62.6	$19,167.20	$306.19				
		Santee Cooper TOTAL:	2437.80	$785,621.03	$322.27				
	SC State Parks								
25	**Barnwell**	Water lily, cattails	5.00	$2,192.50	$438.50	Habitat/Glyphosate/ Renovate Max G	0.750 gal/ac/0.750 gal/ac 180 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	>95% control
26	**Charlestown Landing**	Alligatorweed, Pennywort	1.00	$85.94	$85.94	Clearcast/Glyphosate	0.250 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
27	**Little Pee Dee**	Spatterdock	6.00	$260.25	$43.38	Glyphosate	0.500 gal/ac	Reduce problem plants to enhance public access, use and water quality.	95% control
28	**Sesquicentennial**	Watershield, milfoil	6.00	$2,320.00	$386.67	Renovate Max G	200 lbs/ac	Reduce problem plants to enhance public access, use and water quality.	>95% control
		TOTAL:	18.00	$4,858.69	$269.93				
		SCDNR TOTAL	2063.39	$266,144.40	$128.98				
		SANTEE COOPER TOTAL	2437.80	$785,621.03	$322.27				
		STATE PARKS TOTAL	18.00	$4,858.69	$269.93				
		GRAND TOTAL	4519.19	$1,056,624.12	$233.81				
			2081.39	$271,003.09	$130.20				

APPENDIX H

Summary of Public Comments, Responses, and Plan Modifications to the Draft South Carolina Aquatic Plant Management Plan

Summary of Public Comments, Responses, and Plan Modifications to the Draft 2011 South Carolina Aquatic Plant Management Plan

Santee Cooper Lakes

227 comments, 71 opposed, 156 supported

Comments:
Opposed:

I would like to commend the South Carolina Department of Natural Resources and Santee Cooper on their efforts of transplanting Vallisneria on Lake Marion. Their actions are crucial in revamping wildlife habitat in this area. With this being said, I do not find the increase of White Amur beneficial or relevant to this plan. I fear that an increase of this magnitude will jeopardize the vulnerable Vallisneria beds after the Hydrilla is under control. It is doubtful that such a large increase in this population was from natural causes, in other words, if Hydrilla would not have been introduced as a management tool, I do not believe that we would have seen such a great increase in the White Amur population last year. I am writing in hopes that you will take in consideration returning the White Amur population to 12,000 rather than increasing it over 18,000 fish by this year. I realize that once the Hydrilla population is decreased the White Amur will be left to eat less desirable plants such as Coontail and Vallisneria; however, I know them to adapt to this new diet once Hydrilla is no longer present. The reduction of White Amur will be multi-beneficial for the majority of wildlife that yearly inhabits this area. I hope that this benefit of wildlife is taken into account when drafting the plan. We have two wonderful lakes- both of which are more than capable of hosting the most diverse inland ecosystem in the state. This capability should be capitalized upon for the benefit of wildlife and South Carolinians alike. (Clossman, A.)

I am writing in regards to the 2011 Aquatic Plant Mgmt Plan. First I would like to commend SCDNR and Santee Cooper for their efforts in transplanting Vallisneria on Marion. This program is crucial in rebounding wildlife habitat. I am pleased at last year's efforts and look forward to helping this spring and summer. I would also like to express my displeasure with the increase in white amur. I believe the increase was due to hydrilla propoganda rather than sound biology, and had hydrilla never been brought up as a management tool, the responses last year would've never reached the number it did. I request a return to the sustained 12k fish, rather than an increase to 20k, plus an additional 10k this year. I fear that an increase of that magnitude may jeapordize the vulnerable vallisneria beds once the hydrilla has been controlled. I realize plants such as coontail and vallisneria are not preferred by amur, but I also have seen them eat less than desirable plants when hydrilla was not present. I hope that the benefit of wildlife is taken into account when drafting the plan. We have two wonderful lakes, capable of hosting the most diverse inland ecosystem in the state, and I think we should capitalize on it for the benefit of all South Carolinians!(Brammer, A.; Stone, A.; Saxon, B.; Towell, B.; Bonge, B.; Montgomery, C.; Billings, C.; Eddy, C.; Bartley, C.; Hawkins, C.; Hutto, D.; Felkel,

D.; Davis, B.; Clark, D.; Fasano, D.; Finkbeiner, E.; Allred, G.; Hansen, H.; Higgins, J.; Abell, J.; Tant, J.; Williams, J.; jkraskojr; Smith, J. Brewer, K.;Godbolt, K.; Huggins, K.; Tiller, L.; Reich, M.; Motes, M.; Coulter, M.; Altman, M.; Joyner, M.; Polk, N.; Mirmow, N.; Watson, P.; Nguyen, P.; Rodelsperger, R.; Boyken, R.; Reynolds, R.; Tiller, S.; Gibson, S.; Suggs, H.; Finkbeiner, T.; Sumter, T.; McCaskill, T.; Whitney, T.; Siwarski, T.; Rogers, T.; Boyd, W.; Murphy, W.; Hyleman, Z.; Thomas, Z.)

Now that the lake is starting to make a comeback, do not kill it by adding 16,400 grass carp in 2011. I realize that there are some plants that are starting to take over some areas, but the grass carp are not the answer for controlling those species. Another problem that I have is that SCDNR is going to spend $825,000 on attempting to control unwanted species in our lake by releasing grass carp. (Baker, B.)

I for one am completely against an increase and in fact would like to see this number decreased instead of increasing. The lake is finally beginning to rebound from the disater that was caused by the total erradication of both native and non native grasses during the late 1990's (Johnston, T. III)

As the return of SAV on our lake systems is helping the Wildlife tremendously, the natural species are only growing in small portions on the lake systems. Once the hydrilla is under control the carp are going to move on to other species to feed on such as vallisneria.(Stone, C.)

You turned the white bass into perch. You turned the ducks into cormorants. You turned the stripers into garfish. Is your master plan to turn the catfish into carp? You suck.(Dalton, G., Godbolt, K.)

I am writing to let you know that I oppose the increase in carp for the purpose of controlling invasive weeds. I fear that a large increase will be detrimental to the native plants on the lake. Once the carp get finished eating what little hydrilla is on the lake, they will take to whatever other plants they can find to survive.

Dont get me wrong, I think you all have done a fine job with our lake system, but once again I feel like your losing sight. I believe that "control" needs to be taken out of the plan and "suppress" be the answer. There are thresholds that need to be set here and not at the current 0%.(Parrott, M.)

Please do not put the extra grass carp in the lake.(Lowe, P.)

While I understand the need to control the hydrilla within the lake system, having the lake as bare as a desert is not conducive to wildlife and fish. I would strongly recomend not icreasing the number of grass carp within the Santee Cooper lake system.(Nalley, R.)

I would like to see a cut back on the weed and native grass control in our lakes. With more native grasses growing in bodies of water in SC, the better off our wildlife will be.(Sharpe, C.)

I am writing to express my concern over your release of additional carp into the lakes known as Marion and Moultrie. Those non native fish have done as much damage ot the lake system as the weed they are to eat. Somewhere there should be a compromise instead of just releasing more fish.(Watson, P.)

Supported:

The Santee National Wildlife Refuge (NWR) would like to express support for the 2011 South Carolina Aquatic Plant Management Plan developed by the SC Aquatic Plant Management Council and SCDNR. The plan is consistent with U. S. Fish and Wildlife Service (Service) policy on *control* and removal of exotic invasive organisms that have harmful impacts on aquatic natural resources and on the human use of these resources. Additionally, the plan is consistent with the Santee NWR Comprehens.ive Conservation Plan goals and objectives. The occurrence and spread of exotic, invasive, and nuisance plant and animal species has been identified by Service staff and intergovernmental partners as one of the priority management issues facing SanteeNWR. (Epstein,M. USFWS)

The Berkeley Chamber supports the S.C. Aquatic Plant Management Plan. We feel that to have the balance in the lakes that we need to maintain the aquatic vegetation. The Santee Cooper lakes are an economic engine for our region and one with great potential for future development. We appreciate DNR and Santee Cooper's commitment in keeping our lakes healthy. (Morgan, E.)

The Santee Cooper Striped Bass Coalition wishes to voice its support of the 2010 South Carolina Aquatic Plant Management Plan. The controlled stocking of Sterile Grass Carp has been the primarily resource of managing the Hydrilla and allowing native aquatic vegetation to nourish which is Santee Coopers and SCDNR main objective. Our group will continue to support the 2010 SC Aquatic Plant Management Plan as long as the efforts are intended to control the Hydrilla while enhancing native aquatic plant populations. We strongly feel that it is an important factor that we place our trust with the professionals at Santee Cooper. the SCDNR and other associated agencies which are the most qualified in making the responsible decisions based from decades of data collection.(Riley, E. Santee Cooper Striped Bass Coalition)

That being said we want to thank DNR and Santee Cooper for the excellent job they have done in the past to control the non-native plants that exist in our lake system so we can accomplish our goals. We remember all to well the negative impact hydrilla had on our lakeside businesses, homes, boating and fishing and the huge negative impact it had on tourism in our region. The vegetation was so thick that many areas of the lakes were inaccessible. Marina operators worried that they may go out of business due to the lack of fishermen coming to their properties and lakefront homeowners worried about how this infestation would affect their property value. This commission is committed to supporting all efforts that prevent this from ever happening again. (Shriner, M. Santee Cooper Country)

The South Carolina Aquatic Plant Management Plan is a reasonable proposal to control non-native, invasive plants from detracting from the recreational uses of Santee Cooper Lakes. Good fishing, boating, skiing, and swimming conditions are important features in maintaining a desirability quality of life in area around the lakes. In closing, the Orangeburg County Chamber of Commerce believes that the South Carolina Aquatic Plant Management Plan is a responsible approach to protect the

ecological and recreational character of the Santee Lakes.(Coleman, D Orangeburg County Chamber of Commerce)

Santee Cooper wishes to voice its support of the 2011 South Carolina Aquatic Plant Management Plan. In particular, we strongly support that portion of the plan concerning higher maintenance stocking rates of sterile grass carp to control increasing growths of the submersed noxious plant hydrilla. Detrimental impacts included degradation of water quality and associated large-scale fish kills, displacement of desirable native aquatic plant species, interference with boating. swimming, fishing and other recreational activities, disruption of hydroelectric power generation and suppression of local area economies. Santee Cooper, along with the South Carolina Department of Natural Resources and the United States Army Corps of Engineers, expended some $20 million to bring this plant under control, something that did not happen until the lakes were stocked with sterile Chinese Grass Carp, under a plan approved by the Aquatic Plant Management Council. Today, despite recent grass carp maintenance stocking efforts, our staff is observing a rapid increase in the level of hydrilla in the lakes. This increased infestation is already having a negative impact on the growths of native vegetation that have become established throughout the system.(Singletary, R. Santee Cooper)

I would like to state my support for the 2011 SC Aquatic Plant Management Plan developed by the SC Aquatic Plant Management Council and SCDNR. (Raymond, D.; Lane, L.; Baker, D.; Olive, T.; Denning, R.; O'Connor, J.; McIntosh, N.; Stokes Jr., R.; Lyons, B.; VanderBand, R.; Herrington, J.; Hacker, B.; Bodenheimer, J.; Brunson, J.; Weber, B.; Outen, P.; Outen, P.; Gude, M.; Gude, P.; Gude, A.; Hutcheson, C.; Hutcheson, T.; Sheehan, M.; Sheehan, V.; Printzlou, J.; Kinsley, E.; Shirley, C.; Mackenzie, R.; Koppelkam, S.; Harrington, L.; Floyd, K.; Miller, J.; Kelley, A.; Kelley, A.; Cagle, C.; Gleaton Jr. E.; Newman, E.; Christian, M.; Newman, J.; Christian, C.; Cozart, D.; Cozart, B.; Palladino, J.; Palladino, M.; Peters, E.; Davis, C.; Gleaton, D.; Thrasher, K.; LeBlane, N.; Paranet, H.; Shontere, L.; Shontere, B.; Bourne, P.; Ziegler, M.; Renrig, H.; Rowe, W.; Taylor, J.; Turner, J.; Turner, L.; McCarthy, J.; Wing, P.; Wing, J.; McCarthy,; Von Linsowe, D.; Truesdale, W.; Casanta, R.; Ard, D.; Beaty, C.; Geseppa, G.; McClain, K.; McClain, O.; Moore, P.; Dana, M.; Tanner, D.; Dorn, J; Ritterman, D.; Atkin, M.; Moore, T.; Hatcher,K.; Hatcher, J.; Dill, A.; Shaling, S.; Raymond, D.; Raymond, J.; Potter, H.; Rodriguez, N.; Rodriguez, G.; Pack, C.; Ridgeway, B.; Andrews, V.; Hoyt, K.; Shelton, B.; Shelton, B.; Shelton, H.; White, R.; Moore, T.; Cox, L.; Welch, K.; Cox, P.; Soles, T.; Soles, M.; Bodenheimer, G.; Lynch, L.; Scott, J.; Straus, R.; Gousen, E.; Londeree, J.; Carroll, B.)

The purpose of this letter is to express my support for your Draft 2011 Aquatic Plant Management Plan. I believe that your current plan is geared to minimizing the impact the weed control will have on fishing while insuring that recreational activities on the lake will not be impacted by hydrilla.(Durbis, J.; Robins, R.; Drastura, L.; Lyman, J.; Holliday, J.; White, H.; Harrelson, A.; Hall, J.; James, D.; Nabholz, J.; Gottleb, J.; Campbell, G.)

Response:

SCDNR and Santee Cooper continue to agree that we need aquatic vegetation in the Santee Cooper Lakes to have a great natural resource. We also agree that vegetation absolutely needs to be of the native variety and not hydrilla. Eradication of established hydrilla utilizing current technology is virtually impossible. The goal of aquatic plant management on the Santee Cooper Lakes is to reduce hydrilla acreage while promoting a diverse natural habitat for fisheries, waterfowl and other animals. That goal is set forth in a Memorandum of Understanding between Santee Cooper and the SCDNR. The MOU provides for a minimum of 10% of the surface area of the lakes to be maintained with a diverse assemblage of native aquatic plants which includes a combination of submersed , floating leaf, and emergent plant species that provide habitat and food for game and non-game fish and wildlife species. According to last year's survey almost 17% of the Santee Cooper system has aquatic vegetation. This is well above the 10% minimum. Hydrilla, at its peak coverage, never covered more than 25% of the total surface area of the Santee Cooper lakes. At this level, the plant had a devastating effect on all lake uses and users.

Last year the Santee Cooper Lakes were at 20,000 fish system-wide. That is 1 fish for every 8 surface acres, which is considered maintenance mode. We saw increases in both native vegetation and hydrilla. Acreage for submersed vegetation alone is around 10%, with total vegetative coverage in the 17% range.

The hydrilla increase is what is so problematic. The hydrilla acreage doubled from 400 acres to 800 acres on the main lake system. It actually replaced some of the native eel grass (Vallisneria) in some coves in lower Marion and upper Moultrie. This year's stocking rate targets 6400 fish to replenish the existing numbers and keep them at the 20,000 required for maintenance mode and an additional 10,000 to specifically target the increase in hydrilla, about 400 acres more, or about 25 fish per vegetated acre for the new hydrilla. If left unchecked we will begin the transition to a hydrilla dominated system as the hydrilla has already started to outcompete and replace the native species such as eel grass and bacopa. The total stocking number for this year is 16,400. The vegetative coverage will be closely monitored for any changes.

In order to enhance native plant growth and habitat, innovative management techniques shall be utilized. These techniques will include introducing desirable native plant species, enhancing wildlife and waterfowl management areas and implementing strategic lake level management measures. Those efforts to establish additional native vegetation such as eel grass is already underway. Santee Cooper and SCDNR staff spent numerous hours on the lakes in an effort to harvest seed for additional plantings in the spring and summer. Techniques are currently being developed for more efficient and effective planting techniques

Also included in the MOU is annual monitoring of the vegetative community and a cooperative effort to monitor the health of the fishery and waterfowl populations. The data derived from annual surveys will be utilized in an annual meeting between SCDNR and Santee Cooper to review the

results of monitoring and treatment programs and to determine the effectiveness of the programs and to develop annual work plans.

In the 15 years that hydrilla has been under control in the Santee Cooper system, the system has not experienced one single fish kill resulting from dissolved oxygen depletion; we do not have vast areas of our lake becoming “dead zones’ in the late summer due to anoxic conditions; there have been no commercial boat landings going out of business as a result of restricted access; no farmers have had to fight to keep their crops alive due to clogged irrigation intakes; no industries have had to curtail or cease operations because of hydrilla clogging water intakes; mosquito populations are a fraction of what they were during the peak of hydrilla infestation, one reason that we still have not documented a single human case of West Nile virus or any other arbovirus illness in the area; we have seen a significant expanse of native submersed vegetation under the current stocking plan/rate; bass fishing organizations have set all-time national records for daily and tournament catch rates; and we are no longer deluged with angry letters and telephone calls from area residents, lake users (including fishermen and hunters), businesses and politicians due to the problems caused by the uncontrolled growth of the plant.

Aquatic plant coverage of the Santee Cooper lakes will continue to be monitored and will be determined annually through the use of an independent, third-party contractor utilizing aerial infrared and multi-spectral photography, followed by intense ground truthing verification. This effort, conducted since the mid-1980’s, represents the state-of-the-art in aquatic plant monitoring.” According to surveys done in that period of time (1999-2007) the lowest amount of vegetation was about 9600 acres in 2003, with only 1200 acres of submersed vegetation. From 2003 forward submersed vegetation increased yearly with 1700 acres in 2004 up to 12,244 acres in 2010 system wide. While only 2008 showed a decrease to 6360 acres of submersed vegetation attributed to the lack of water in a severely drought impacted system. Sterile grass carp are utilized so that we may control their numbers in the lakes and eliminate an overabundance. Current research shows that the carp have an approximate mortality rate of 32% per year. Grass carp have been in the system throughout the entire recent period of vegetation expansion. Some $400,000 was expended to determine the impacts of stocking grass carp in the Santee Cooper lakes, including impacts to fisheries, water quality, and vegetative coverage. Additionally, the U.S. Army Corps of Engineers developed and published a detailed Environmental Assessment for the use of grass carp to control hydrilla in South Carolina in both the late 1980’s and again in 2005. The EA considered impacts to native fish populations, water quality, aquatic plant populations, as well as tourism and recreation (fishing, hunting and boating). Among other positive findings, the EA states that “sterile grass carp provide a safe, cost effective means of controlling nuisance aquatic vegetation in South Carolina. DNR and Santee Cooper are committed to protecting and enhancing the native vegetation community. We plan to continue to monitor their status and take corrective action if unnecessary impacts occur.

Plan Modifications:

No changes necessary

Summary of Public Comments, Responses, and Plan Modifications to the Draft 2010 South Carolina Aquatic Plant Management Plan

Synopsis of Comments for the Santee Cooper Lakes

As of March 2, 2010 - 675 comments, 69 opposed = about 10%

Opposed:

Opposed to all hydrilla control, support management not control

1) Opposed to hydrilla control by grass carp
2) Use mechanical or herbicides
3) Grass carp ate all native vegetation, unacceptable
4) DNR, S-C and APMC is limiting to 10% when 20% is needed, 50% coverage would have no impact on boating, 20-30% on Moultrie and 10% on Marion would be extremely beneficial to economy around the lakes, 30% coverage on Moultrie and 10% on Marion is a great start
5) The current 16-18% coverage figure is inaccurate
6) The plan is not supported with science
7) Needs of fishery are not given adequate weight
8) Not supported by others managing reservoirs, e.g., the Corps of Engineers
9) Resulted in loss of fish and waterfowl habitat, current plan is not working, waterfowlers have seen a severe decline in the numbers of migratory ducks over the last 10-15 years
10) Need to promote selective allowance of native vegetation above I-95, Hatchery, etc.
11) Carp compete directly with waterfowl and other water birds
12) What are the alternatives to grass carp?
13) DNR and S-C should have the responsibility of sustaining and reintroducing natural vegetation to the lakes
14) Suspend carp stocking for one year
15) Opposed on grounds of economic impact, lost fishing license sales, other revenues
16) Carp caused the collapse of the largemouth bass fishery on Lake Murray

Opposed but offered:

Complete coverage of our lakes by any submerged aquatic vegetation should be avoided at all costs

Supported:

SNWR supports as consistent with refuge goals and objectives, also the Berkeley Chamber, Santee Cooper Striped Bass Coalition, Santee Cooper Country, Orangeburg County Chamber of Commerce, Swamp Fox Boat Club, Santee Cooper, Striped Bass Stakeholders, and SC Aquatic Plant Management Society

17) This effort has focused on maintaining biological balance and diverse recreational opportunities, and the draft plan will allow for these efforts to continue
18) an effort is underway to reintroduce hydrilla to the Santee Cooper lakes, and we fervently object to this proposal
19) Hydrilla put a strangle hold on this lake and the thought of putting hydrilla back into this system is appalling, shocking and sickening

20) Please continue stocking grass carp
21) Please approve the draft plan
22) I sincerely appreciate the efforts of the council and DNR in using financial wisdom in order to meet the objectives of invasive species control in light of the current budget constraints on state and federal funds.

Santee Cooper Lakes:

The total number of comments received was 675, of which 606 (90%) supported the plan and 69 (10%) opposed the plan.
A summary of the responses follows and has been divided into two sections, **Opposed** and **Supported**.

Commenters: Anderson, L.; Adams, John; Adcox, Allen; Adcox, Jean; Aldridge, R.; Allen, Joey; Anderson, Chris; Anderson, Rachael; Andrews, P.; Ard, C.; Ardis, R.; Ardis, Ashley; Asbill, K; Austin, M.; Baggett, Kim; Baker, B.; Baker, Letitia; Bakley, Karen; Baldy, Johnny; Ballard, Ronald; Ballard, Linda; Balle, Michelle; Balrick, Trina; Barb, Susan; Barb, Raymond; Barker, E.A.; Barr, Matthew; Barr, Nancy; Baucom, Viola; Baurn, Robert; Beard, Betsy; Beckham, Marley; Beckman, Alan; Beckman, Billie; Bell, B.; Bell, Charles; Bell, Maureen; Benbow, Loretta; best, Arthur; Bevacgua, David; Billings, C.; Bilton, J.; Black, Brittany; Blakley, Linda; Blascak, Evelyn; Booke, Jully; Boudreau, Perry; Bowers, Donnie; Bowers, William; Bowick, Patrick; Bowick, Donna; Bozard, Bo; Bradham, C.; Brady, J.; Brasington, Jeretta; Bratton, Ruth; Breitner, Bruce; Brewer, K.; Brixto, Mike; Brogdon, G.; Broughton, Ted; Broughton, Vicki; Brown, Cory; Brown, Frances; Brown, Kenneth; Brown, Joni; Brown, Wanda; Brown, Bernie; Brown, Dwight; Brown, George; Brown, Dianne; Brown, Joni; Brown, Charles; Brown, Franklin; Brown, Judy; Brown, D.; Brunson, D.; Brunswick, Gary; Bruzik, Martin; Bruzik, Sandy; Bryan, Jerry; Bryant, Randy; Burbage, Bill; Burns, L.; Burns, M.; Butler, Michele; Buxton, Nancy; Cagle, Carolyn; Cagle, Jill; Cagle, April; Cagle, Kevin; Cagle, Carl; Cagle, Carolyn; Calloway, Ricky; Calters, Bobby; Camp, Delores; Campbell, K.; Campbell, Thomas; Campbell, Grover; Canttey, Heather; Carl, Joseph; Carman, Kay; Carman, Jason; Carr, Fredrick; Carrio, Pauline; Carroll, Wiley; Carroll, Lynda; Cathern, Chris; Catoe, Wayne; Catoe, Suzette; Caycile, Keith; Chapel, Keith; Chapel, Anetta; Chaplin, K.; Chapman, Virginia; Chapman, RM; Charles, Pamela; Chauver, R.J.; Chilst, Logan; Christian, Mary; Christian, Curtis; Church, Ricky; Churty, Harry; Clelteirs, Del; Coffey, Juanita; Cogdill, Wendy; Coker, Amanda; Colclough, Albert; Coleman, D Orangeburg County Chamber of Commerce; Collins, M.; Compton, Sherry; Condon, A.; Conner, Thomeas; Connor, Deane; Cook, Hermin; Costa, Joe; Costa, Gloria; Coto, Robert; Coto, Diane; Coulter, M.; Creel, R.S; Cregan, Daniel; Cross, Charles; Cunningham, Ronald; Cunningham, Kent; Curran, Charmie; Dailey, K.; Dalton, G.; Dalton, Robbie; Danner, Jason; Davis, B.; Davis, H.; Davis, I.; Davis, Jeremy; Davis, Edward; Davis, Elizabeth; Dayle, Leroy; Dean, Brooke; Dehreus, WJ; DeKalb, Robert; Demars, R.; Denit, Clifford; Denning, Margie; Dennis, Ruthie; Dennis, Bobby; Dennis, Margie; Dennis, Jamie; Derr, Barbara; DeWitt, Corrille; Dixon, D.; Dolgas, Sandra; Dolgas, Richard; Dorman, Pamela; Dow, Jerry; Downs, Barry; Drastura, Lilian; Duckworth, Bitsy; Dugan, Christina; Duncan, Sandy; Duncan, Ronnie; Durant, John; Edwards, Blake; Edwards, Jerry; Edwards, Brenda; Edwards, Trent; Edwards, James; Elerts, Steven; Enzor, Martha; Epstein,M. USFWS; Erthley, Frank; Espey, J.; Evan, William; Evans, Carl; Evans, Jonda; Ewen, William; Ezor, Kathy; Failmezzer, Suzanne; Feagers, Feller, L. SC Aquatic Plant

Management Society; James; Fincannon, Stephanie; Fletcher, Robert; Fletcher, Julia; Flowers, RL; Floyd, Earl; Floyd, Tonya; Folkers, Harriette; Formler, Nathan; Foster, Wesley; Foxe, Barbara; Foxworth, Keith; Francis, Barbara; Fraraccio, Robert; Frye, M.; Furse, Judy; Gainey, Frances; Gainey, Harvey; Gainey, Wayne; Gainey, Brenda; Gainey, Keith; Gannon, Kelly; Garlen, Bert; Geddings, Billy; Gerald, Roger; Gibson, Nancy; Gilkers, John; Gleaton, Eddie; Gleaton, Debra; Gleaton, Meloyne; Gleaton, Debra; Gleaton, E.V.; Gleaton, Debra; Glenn, J.; Glenn, Danny; Glenn, Mary; Godfrey, J; Godfrey, Cathy; Goebel, James; Goldsbury, Ralph; Goodman, Al; Goodson, William; Gragan, D.; Gragan, Susan; Grate, Francis; Green, J.; Greenwell, Allen; Gregg, Richard; Gregory, W.T; Groch, D.; Haley, Peggy; Haley, Randi; Ham, Jerry; Hanna, Dale; Hanna, Debbie; Hanna, David; Hanna, Debra; Hanna, Paul; Harkins, James; Harlin, C.; Harmon, F.; Harper, Andy; Harper, Sandy; Harrelson, Alice; Harrington, Walter; Harris, A.; Harris, J.; Harrison, Dolores; Harvin, Thomas; Haselden, M.; Hatte, Charlie; Hawlig, Fran; Hawthorne, D.A.; Hayes, Bobby; Hayes, Beth; Hayes, G.G.; Hayes, Melanie; Hayes, Chrystal; Hayes, Ladd; Haynacki, Judy; Hearn, G.; Heeton, Jeffery; Helton, Sherri; Herbert, Eddie; Herley, Sylvia; Higgins, J.; Hinds, John; Hinds, Winston; Hinds, Marlene; Hobbes, Myrtle; Hobbs, Kim; Hobbs, Rodney; Hodge, W.; Hodge, Brian; Hodge, Martha; Holaber, Katie; Holcombe, Jerremy; Holden, David; Holden, Phyllis; Holliday, William; Holt, Bob; Hooker, Robert; Hooks, C.; Hopkins, Ray; Horne, Cathrine; Horton, Brock; Howe, Sue; Hubbard, Mike; Hubbard, Carolyn; Huff, Shirley; Huff, Jeffery; Huff, Angie; Huff, Courtney; Hughes, Dianne; Hulony, Don; Hunsucker, Dot; Hunsucker, Ed; Hurst, Pat; Huston, Joseph; Huttner, G.; Hutto, Ray; Hutto, Bobbie; Ibert, J.; Jackson, R.; James, Matthew; Janic, Mike; Jarvis, Dwight; Jenkins, James; Johnson, W.; Johnson, Gloria; Johnson, Mitchell; Johnston, T.; Jones, C.; Jones, P.; Jones, Harvey; Joyl, Chan; Just, Amy; Just, William; Just, Pam; Justice, Jack; Keefe, Joni; Kelley, Ann; Kelley, Hoyt; Kelley, Stephanie; Kelley, Ann; Kelley, Alfred; Kelley, Alfred; Kennedy, Susan; Kennedy, Neal; Kennedy, Von; Kimbrell, Tripp; Kindle, Juanita; Kinman, Angela; Kinsler, Emily; Koranloo, Kamran; Krout, Alfred; Lane, Linda; Langston, Iris; Langston, David; Laslo, SJ; Lee, D.; Lee, Marie; Lee, Kathy; Lee, Neil; Lelroy, Leonard; Lemorie, Catherine; Lesemann, John; Lesemann, Linda; Lewis, Joy; Lewis, Stephen; Lewis, J.; Lewis, TR; Lewis, Thomas; Lewis, Karen; Littell, L.; Little, Robert; Lockett, Mary; Locklair, K.; Locklear, I.; Locklear, J.; Logan, Teresa; Londeree, Joe; Londeree, Jean; Lookabill, Ray; Lorthun, Phillip; Love, Bob; Love, Joy; Lowe, P.; Luis, Timothy; Luosrue, Danny; Lykes, Jamie; Lyons, Robert; Magnus, Ryan; Mahoney, Joe; Main, R.; Main, D.; Maletz, William; Martin, B.; Martin, Christine; Martin, Arthur; Mathis, John; Mathis, Matt; Maynard, Gail; Maynard, Rex; McCarthy, John; McCarthy, Betty; McCrary, C.; McCratchen, Craddack; McDonnough, Bob; McDuffie, Scott; McElveen, Robert; McElveen, Brenda; McElveen, Lauri; McElveen, Barber; McElveen, Mike; McElveen, Frankie; McElveene, Luis; McPherarr, Melville; McWatty, S.; Mercer, Wanda; Miles, Julie; Miles, DJ; Miles, Alene; Miles, Iven; Miller, JenniferJo; Miller, Hugh; Miller, Christina; Milley, Jennifer; Mims, Wendell; Mints, Lisa; Mintz, Dan; Mirmow, N.; Mitchell, B.; Moody, E.; Moody, Fred; Moore, Jody; Morford, Charles; Morford, Betty; Morgan, E.; Morris, L.; Morris, Dale; Morris, K.O.; Morris, Barbara; Morrison, K.; Moye, Joyce; Mozdehi, Louise; Mozhdehi, Bruce; Murley, Karen; Murphy, W.; Nadeau, Doris; Nadeau, Henry; Nalley, R.; Nethermann, Jodie; Newman, Claude; Newman, Faye; Newman, Kevin; Norris, Edward; Norris, Francis; Norris, Tony; O'Neal, Doris; O'Neal, G; Obertacz, Carolyn; Odicher, E.; Odom, William; Odom, Marian; Odom, Larry; Odom, Alice; Orders, J.; Osborne, Nikki; Osborne, David; Oseman, A.; Outin, Michael; Outin, Pamela; Owens, Bobby; Paccadori, B.; Pace, J.; Pallodimo,

Michael; Pappas, Chris; Parker, Kelly; Parker, Bret; Parker, William; Perkins, Lynn; Peyton, Sarah; Peyton, Donny; Phelps, PD; Phillips, T.; Plowden, Judy; Polk, Timothy; Poucee, Sandra; Powell, Annelle; Powell, Nelson; Powers, Ronny; Preston, M.E.; Prevatte, Harry; Price, Ronnie; Price, Robert; Price, Larry; Prichard, Pete; Printzrow, Jay; Pritchard, Betty; Prote, Vicki; Ptolemy, Dianne; Puin, Xavier; Quinn, Hazel; Rauber, Linda; Ray, James; Ray, Margaret; Ray, Chris; Raybits, Pat; Raybits, Stan; Reaves, Jim; Reed, Leigh; Reese, Jeannette; Reeves, Darlene; Regan, J.; Reidy, Taylor; Reynolds, R.; Richard, Celia; Richardson, B.; Richburg, Terry; Richmond, Will; Rikalts, Robby; Riley, E. Santee Cooper Striped Bass Coalition; Rimer, Mindy; Rimer, Ricky; Robinson, W.; Robinson, Libby; Robinson, Becky; Robinson, Joyce; Robinson, Paul; Robinson, Elijah; Robinson, Joe; Robinson, Raine; Rodgers, Harry; Rodgers, Michele; Rodgers, Jerry; Rodgers, Luanne; Rogers, John; Rolle, Jon; Ross, Bill; Rosser, C.; Rosul, L.B.; Rourke, Donna; Rouse, Terra; Royue, Jesse; Rudman, Ronald; Runyah, Marc; Samuels, Dona; Sarrio, Charles; Sauyir, Danny; Sayers, Danny; Schmag, Edward; Schmitty, Mike; Schrader, Harry; Schroeder, James; Schulman, Wendi; Schulz, Dina; Sebock, Joanne; Sebock, Randall; Sein, Parris; Seoulnil, B.; Sheek, Robin; Sherma, John; Shriner, M. Santee Cooper Country; Shriner, William; Shuhan, Michael; Shumahe, Christi; Shumahe, John; Sigman, L.; Silver, T.; Simons, T.; Simpson, Grey; Singelton, Alice; Singletary, Mic; Singletary, R. Santee Cooper; Smith, Faye; Smith, Susan; Smith, Joseph; Smultz, Kimberly; Sommers, Pamela; Stackhouse, Dan; Stagg, Julia; Stanbelv, Gus; Steele, Chip; Stickles, V.; Stone, A.; Stoughton, R.; Stours, Debra; Stutts, Kristen; Suis, Susan; Sullivan, Brent; Summersett, Jerry; Summersett, Carla; Summersett, Carson; Summersett, Hunter; Sunderman, Edward; Sweat, Joel; Swetham, J.; Talley, Marla; Tapley, HL; Tapley, Catherine; Terry, Jay; Thames, Jefferey; Thigpen, Cheryl; Thomas, S.; Thompson, A.; Thompson, R.; Thompson, S.; Thompson, T.; Thompson, Marilyn; Thots, Bernie; Thysine, Dwayne; Tiller, S.; Timdall, Angela; Timmerberg, T.; Tomlinson, Jeromy; Toporek, Matt; Truesdale, Harold; Tucker, J.R.; Turner, Clyde; Valdaliso, Darren; Vallieres, Juan; Vanderbard, Ross; Vandyke, C.; Varn, R.; Varn, Gerald; Varn, Paula; VonLinsome, Richard; VonLinsovch, Richard; Wagner, N.; Wagner, B.; Walker, Robert; Walker, Norvelle; Walker, Nelson; Walters, S.; Ward, Kathy; Warren, Linda; Warren, Harvey; Warren, Harvey; Warren, Linda; Watson, P.; Watson, Leroy; White, Hallett; Williams, J.; Williams, L.; Wilson, W.; Wilson, James; Wilson, James; Wilson, Andy; Wilson, Jon; Wing, Robin; Wise, Bridget; Wolter, Elizabeth; Worsham, Marion; Worsham, Freda; Wright, Jimmie; Wright, P.; Wyndam, Shirley; Yaeger, Michael; Yaeger, Mary; Yailyer, Robbie; Young, Henry; Young, Margaret; Young, Francis; Young, Michael

Comments:
Opposed:

As a member of Santee Bass Matters, a group of over 40 members and growing rapidly, we are most defiantly against any more stocking of grass carp for the control of these plants. Our data and research has revealed that even the Corp of Army Engineers do not endorse the use of grass carp as a means of grass control. They prefer herbicide and mechanical when possible. Their reasoning is that grass carp is an uncontrollable means that is potentially devastating to natural vegetation after the targeted hydrilla is eradicated. In their efforts of control of hydrilla for the Lake Seminole, they stated that % vegetation should be at least 20%. Why then is DNR trying to control to 10%, when all data we have accumulated states that a minimum of 20% is needed. Our contention is that after the hydrilla was gone, the remaining grass carp devastated the remaining natural vegetation to the

point it was impossible to sustain fish reproduction as needed. We contend the lake has never come close to recovering. This lack of recovery and the inability to catch fish has severely cost our local economies many millions of dollars. We have lost over 50% out of state license sales in the past 5 years alone. It doesn't take a rocket scientist to figure out how much this has affected our local economy. (Avin, J. Santee Bass Matters)

Santee has gone from a fish and duck haven to a grass carp, cormorant, and catfish haven, thanks to DNR and your supposedly diploid grass carp. (Green, J).

Surely there is a way to allow some beneficial vegetation in areas above the 95 bridge, Ferguson and Rocks Pond flats, the Hatchery, and other areas too shallow or stumpy for water skiing and pontoon playing. (Green, J).

No more grass carp in Santee Cooper and Lake Murray please. (Green, J).

The eradication of all vegetation that we witnessed in the late 90's -2007 is unacceptable to our environment. This was a huge natural resource blunder that take Santee Cooper many years from which it can recover. Complete coverage of our lakes by any submerged aquatic vegetation should be avoided at all costs. Even 7 grass carp/submersed vegetated acre resulted in the complete elimination of submersed and emergent vegetation, creating an underwater desert like we witnessed on Santee Cooper lakes system. Proceed with caution so we avoid, at all costs, another colossal Natural Resource error that we experienced over the past decade by creating an underwater desert again. I noticed this year that the management plan indicates that goal for hydrilla is to "Manage hydrilla growth in the main lake and sub impoundments to minimize its spread within the lake, which is different from prior years. (Williams, J.)

Please help weeds come back to the lakes. Manage them in a controllable way, not uncontrollable carp. Please think about the sportsmen that try to fish and hunt the public waterways also. (Collins, M.)

I am opposed any additional releases of grass carp into Lakes Marion and Moultrie. The introduction of sterile, triploid, grass carp into these lakes in the mid-1990's not only removed the problematic hydrilla, it devastated many native aquatic plants species as well. Grass carp, of course, only control plant species of the highest food value thereby competing directly with waterfowl and other native water birds. I support only the selective spraying and/or harvesting of non-native and invasive species along with the planting and cultivation of plant species that are either native to the system or beneficial as food or habitat for wildlife and fisheries.(Davis, H.; Orders, J.; Bradham, C.; Thomas, S.; McWatty, S.)

They are in dire need of susbstantial aquatic vegetation.

It has come to my attention that most of these concerned citizens feel that the SCDNR, The APMC, and Santee Cooper Electric Cooperative have no desire to increase the amount of aquatic vegetation on these reservoirs.

So, why is that only 10% of the total system is allowed to host aquatic vegetation, when nearly 50% coverage could be maintained with no effect on recreational boaters(a minority on the Santee Cooper lakes) and hydro power functioning? It states that hydrilla will be managed on the lakes and sub impoundments to control the spreading throughout the whole lake system.

I was happy to see this, versus Mr. Delokosloski's plan of total eradication. (McCrary, C.)

I have seen a continued decline in the lake as a world class fishery and duck hunting hot spot. I would however like to ask that we try to manage aquatic grass rather than eliminate it. (Bilton, J.)

Please allow the use of controlled hydrilla or something to bring our birds back. (Harlin, C.)

So Chris if you could help us as SC residents keep the grass on the lake and send me a little info on the things being done for the lake that would be appreciated. (Stoughton, R.)

I have a great deal of concern for the lack of habitat for fingerling fish and the lack of a food source for migratory waterfowl. The supporting,funding, and release of nuisance fish and/or use of chemicals being applied to public waters for the sole purpose of aquatic vegetation destruction (I.e. destruction of waterfowl food source and fingerling fish habitat) must be stopped. I would like to hear what alternatives there are instead of total habitat destruction?(Nalley, R.; Hooks, C.)

As a sportsman I find the policies of eradication rather than management concerning. Please consider reducing the number and frequency of stocking nonnative "steralized" grass carp and other methods used to eradicate aquatic veg. (Condon, A.)

I see a direct correlation with this decline to the massive eradication of invasive weeds that took place in the late nineties. The current weed control plan is not working where the fish and waterfowl are concerned. (Johnston, T)

Just another quick note to express my concerns about the lack of vegetation on the santee-cooper lakes. I would like to see more aquatic vegetation that will help. (Asbill, K.)

Please take into consideration the impact on food sources for migratory waterfowl, and the habitat for fingerling fish. Waterfowlers have seen a severe decline in the numbers of migratory ducks over the last 10-15 years. And the quality of fishing is declining as well. (Little, T.)

I sincerely hope you will rigidly confine eradication of primrose, water willow, fragrant water lily and the others and even hydrilla to some extent to the areas stated in the plan. Many of us appreciate the fact that the expansion of hydrilla became a significant problem. We are not insensitive to the need for control. A concern is that there will be collateral elimination of habitat in the course of controlling hydrilla to the extent it appears is the plan. Both chemical and biological control will likely continue to result in indiscriminate loss of desirable habitat. More recently we've experienced the loss of vegetation that clearly contributed in making Santee Cooper a major destination for anglers pursuing a variety of fish species. An alternative and very popular approach could be to genuinely manage vegetation with fisheries interests in mind.(Glenn, J.)

I feel as if we (hunters and fisherman) are the only people that don't have a voice in how the aquatic nuisance program should enforced on the lakes. There is no doubt that anyone who has fished or hunted on the lakes in the past has seen what once was a great thriving lake system , be turned into a dead lake system void of ANY type of useful vegetation. I also think that DNR and Santee Cooper should and does, have the responsibility of sustaining and reintroducing natural vegetation to the overall Health of these Lake systems. (Coulter, M.)

Why mess w/something NATURAL that works!!! Bring the grass back!!! (Jackson, R.)

This email is sent in opposition to overmanagement of aquatics in our waterways. (Haselden, M.)

I am deeply concerned about the continued introduction of grass carp and herbicides in the lakes to control weeds, as both are non-selective they not only destroy non-native strains but also all beneficial aquatic vegetation used by waterfowl and fish.The lakes used to be a waterfowl mecca…now they are a desert.Their has to be a way to compromise to allow the growth of native vegetation beneficial to waterfowl and fish and re-introduction of beneficial aquatics , button brush , etc. to help encourage waterfowl to return to the lakes, benefitting not only waterfowl and fisheries , but also the economy around the lakes. (Campbell, K.)

Santee Cooper MUST realize it is a state agency to serve the people of SC and realize that Is a lot more than the production of power and their wallets. (Watson, P.)

I AM SENDING YOU AN EMAIL IN REFERENCE TO SANTEE COOPER AND OTHERS TRYING TO ERADICATE ALL THE AQUATIC VEGETATION FROM LAKE MARION. I BELIEVE THAT THE PEOPLE THAT ARE COMING UP WITH THESE GENIUS IDEAS KNOW NOTHING ABOUT WHAT AQUATIC VEGETATION MEANS TO A BODY OF WATER. THERE ARE ALOT OF BENEFITS THAT COME FROM THE VEGETATION THAT "WAS" IN THE LAKE. (Phillips, T.)

I'm writing this letter because I feel that the way of dealing with invasive weeds and/or vegitation in Lakes Marion and Moultrie is not working. In times where our DNR buget s allready strained. Why not look at other means of managing the vegetation in these lakes and others? The carp that have been put into the lake have destoried almost all of the native and invasive vegitation in the lakes. I would like to see some kind of compromise. (Reynolds, R.; Higgins, J.)

I don't believe many want to see the 80-90%coverage we had in the early 90's, but 20-30% on Moultrie and 10% on Marion would be extremely beneficial to economy around the lakes. Certainly, the natives have started to make a comeback, and that is good, but we can not make the mistakes of the past with the overstocking of sterile grass carp and over spraying, and other control methods. (Oseman. A.; Tiller, S.; Lee, D.; Williams, J.)

Please allow the aquatic vegetation to once again grow in the Santee Cooper lakes. (Martin, B.)

Native vegetation, along with Hydrilla provided an extremely productive habitat for all species of fish, as well as creating a major food source for migratory waterfowl that wintered in SC.

These fish, along with spraying chemicals to aid in killing Hydrilla, literally wiped out all of it, including native vegetation. The quality of habitat took a major hit, and our once nationally renown fishery wasted away. (Regan, J.)

I would like to see the natural habitat allowed to come back to our lakes so we can again see waterfowl using our lakes again. (Ard, C.)

Sir, I do not know all about the good nor bad types of weeds(grass) that Santee Cooper Co-Op. wants to prevent from being in the lakes, but I do think there is some kind of middle ground that can be reached. (Brogdon, G.)

I have kept abreast of recent reports regarding the current amount of vegetation on both lakes Marion and Moultrie(listed as 16-18K acres). I feel that these numbers are completely inaccurate and do more damage than the actual vegetation itself. I believe that there is far less of this habitat and it has had a direct economic affect on our great state. I urge you to please verify these numbers and furthermore to take into consideration the fisheries and wildlife habitat that these vegetations provide. (Stone, A.)

True, excessive coverage of the lakes is unacceptable, but "total eradication" as the stated DNR goal per my inquiries is equally unacceptable. 30% coverage on Moultrie and 10% on Marion is a great start and would vastly increase the recreational dollars generated by these lakes. (Dalton, G.)

Since the habitat has been destroyed at Potato Creek, along with the rest of the lake, we have lost more than a place to hunt. I hope DNR along with Santee Cooper can take this into consideration when deciding where to kill habitat in the future. (Dixon, D.)

What concerns me is the lack of habitat for the new fry and fingerlings brought to the lake and born into the lake each year. I know it is a long shot, but I would like to see some of the aquatic vegetation put back into the lake. (Murphy, W.)

I along with many others are very concerned with the habitat situation on the Santee Cooper lakes. There is little to no food source in the lake for migratory waterfowl and very very little food on the refuge for waterfowl. (Brewer, K.)

I ask that the release of carp be suspended for one year. (Lowe, P.)

I sent a message last night & also ment to mention also that if any spraying is to be done on any lakes including the Santee Cooper Lakes,it should not start untill early June,let the fish finish their spawn & have a little time to move from the shallows to other cover.This might give the fry a better chance to survive. (Davis, I.)

Please get some aquatic vegetation back into our state lakes. The effort to eliminate hydrilla kills fishing for all kinds of fish. Loss of tourist dollars and in state fishing lincenses is huge. The impact on the state economy is huge when all the fish are killed by the current policy of complete eliminate of aquatic vegetation. Some hydrilla in the water is money in the bank for a state that needs help. (Harmon, F.)

The fishing & hunting have both decreased due to the lack of good habitat, but I do understand the power generation side and how the grass is a potential problem. There has to be a good balance of the two. Our local economy depends on a healthy lake system. As a result the big fishing tournaments are leaving and our tourism is suffering. This is a fact. (Baker, B.)

I strongly believe that our lakes have been severely harmed by the extent of eradication of hydrilla and the introduction of grass carp. The grass carp are destroying all grasses not just controlling them. I strongly urge the adoption of a plan to control both the carp and the hydrilla. I'm told that the goal of many is total eradication.

The Management Plan does not require a documented review of the impact of desirable fish populations following aquatic plant eradication in the large state reservoirs. The plan simply reviews reduction of the targeted aquatic plants and not what subsequently happens to desirable fish populations.

The aquatic plant eradication at Lake Murray has been overly effective and caused an unwanted collapsed of the large mouth bass population for Lake Murray. (Timmerberg, T.)

I am a concerned outdoorsman who writes in opposition to the 2010 Draft S.C. Aquatic Plant Management Plan, particularly as it applies to Lake Marion and Moultrie. I support the position taken by Santee Bass Matters, a rapidly growing group of fishery advocates on the Santee Cooper lakes.

First, I am concerned that the needs and importance of the Santee Cooper fishery are not given adequate weight in this plan.

In the past 5 years alone we have lost 50% of our out-of-state license sales, which has had a devastating effect on marinas, motels, restaurants, tackle shops, gas stations, guide services, grocery stores, real estate companies, local boat and motor repair shops, live bait providers, convenience stores and multitudes of other local businesses. Tens of millions of dollars are lost each year.

Second, I am adamantly opposed to the use of grass carp to control aquatic vegetation on Santee Cooper. They have nearly destroyed the Santee fishery once, and as the Army Corps of Engineers states they are uncontrollable and will not stop at eating hydrilla – they also consume native vegetation. Herbicide and/or mechanical treatment should be used where necessary.

Third, 10% vegetated acreage is not enough, and the Corps has stated that 20% is ideal.

Finally, I support control of hydrilla, not eradication of hydrilla. I am not opposed to complete control in high traffic areas such as housing, boat ramps, marinas and campgrounds, but outlying areas should be the focus of a controlled return. This should be undertaken with herbicides and/or mechanical control, instead of grass carp.(Demars, R.; Hearn, G.; Silver, T.; Morrison, K.; Anderson, L.; Mirmow, N.; Austin, M.; Morris, L.; Bradham, C.; Wagner,B.; Frye, M.; McWatty, S.; Ardis, R.; Groch, D.; Davis, B.; Billings, C.; Mitchell, B.; Williams, J.; Hodge, W.; Davis, I.; Locklear, J.; Locklear, I.; Moody, E.; Richardson, B.; Bell, B.; Avin, J. Santee Bass Matters)

Supported:

The Santee National Wildlife Refuge (NWR) would like to express support for the 2010 South Carolina Aquatic Plant Management Plan developed by the SC Aquatic Plant Management Council and SCDNR. The plan is consistent with U. S. Fish and Wildlife Service (Service) policy on *control* and removal of exotic invasive organisms that have harmful impacts on aquatic natural resources and on the human use of these resources. Additionally, the plan is consistent with the Santee NWR Comprehens.ive Conservation Plan goals and objectives. The occurrence and spread of exotic, invasive, and nuisance plant and animal species has b en identified by Service staff and intergovernmental partners as one of the priority management issues facing SanteeNWR. The Service supports: 1) the control of exotic invasive species , 2) enhancement of native plants for the benefit of our natural resources, and 3) the stated management objectives and techniques for invasive species prevention, detection and treatment leading to control and enhancement of fish and wildlife habitats. (Epstein,M. USFWS)

The Berkeley Chamber supports the S.C. Aquatic Plant Management Plan. We feel that to have the balance in the lakes that we need to maintain the aquatic vegetation. The Santee Cooper lakes are an economic engine for our region and one with great potential for future development. We appreciate DNR and Santee Cooper's commitment in keeping our lakes healthy. (Morgan, E.)

The Santee Cooper Striped Bass Coalition wishes to voice its support of the 2010 South Carolina Aquatic Plant Management Plan. The controlled stocking of Sterile Grass Carp has been the primarily resource of managing the Hydrilla and allowing native aquatic vegetation to nourish which is Santee Coopers and SCDNR main objective. Our group will continue to support the 2010 SC Aquatic Plant Management Plan as long as the efforts are intended to control the Hydrilla while enhancing native aquatic plant populations. We strongly feel that it is an important factor that we place our trust with the professionals at Santee Cooper. the SCDNR and other associated agencies which are the most qualified in making the responsible decisions based from decades of data collection.(Riley, E. Santee Cooper Striped Bass Coalition)

That being said we want to thank DNR and Santee Cooper for the excellent job they have done in the past to control the non-native plants that exist in our lake system so we can accomplish our goals. We remember all to well the negative impact hydrilla had on our lakeside businesses, homes, boating and fishing and the huge negative impact it had on tourism in our region. The vegetation was so thick that many areas of the lakes were inaccessible. Marina operators worried that they may go out of business due to the lack of fishermen coming to their properties and lakefront homeowners worried about how this infestation would affect their property value. This

commission is committed to supporting all efforts that prevent this from ever happening again and backs DNR's the proposed 2010 plant management plan for the Santee Cooper lakes system.(Shriner, M. Santee Cooper Country)

The South Carolina Aquatic Plant Management Plan is a reasonable proposal to control non-native, invasive plants from detracting from the recreational uses of Santee Cooper Lakes. Good fishing, boating, skiing, and swimming conditions are important features in maintaining a desirability quality of life in area around the lakes. In closing, the Orangeburg County Chamber of Commerce believes that the South Carolina Aquatic Plant Management Plan is a responsible approach to protect the ecological and recreational character of the Santee Lakes.(Coleman, D Orangeburg County Chamber of Commerce)

Santee Cooper wishes to voice its support of the 2010 South Carolina Aquatic Plant Management Plan. In particular, we strongly support that portion of the plan concerning higher maintenance stocking rates of sterile grass carp to control increasing growths of the submersed noxious plant hydrilla. Detrimental impacts included degradation of water quality and associated large-scale fish kills, displacement of desirable native aquatic plant species, interference with boating. swimming, fishing and other recreational activities, disruption of hydroelectric power generation and suppression of local area economies. Santee Cooper, along with the South Carolina Department of Natural Resources and the United States Army Corps of Engineers, expended some $20 million to bring this plant under control, something that did not happen until the lakes were stocked with sterile Chinese Grass Carp, under a plan approved by the Aquatic Plant Management Council. Today, despite recent grass carp maintenance stocking efforts, our staff is observing a rapid increase in the level of hydrilla in the lakes. This increased infestation is already having a negative impact on the growths of native vegetation that have become established throughout the system.(Singletary, R. Santee Cooper)

My concerns are the concerns of many homeowners on Lake Marion. I have been living here (Taw Caw Subdivision) for twelve years. I was here when hydrilla put a strangle hold on this lake and I am appalled, shocked and sickened by the thought of putting hydrilla back into this Lake.(Hinds, W.)

We, the Swamp Fox Boat Club, voted unanimously Monday night February, 22, 2010 to support the 2010 C Aquatic Plant Management Plan which was developed by the SC Aquatic Plant Management Council and SCDNR. Santee Cooper and the South Carolina Department of Natural Resources have worked together in the past to rid the lakes of this terrible invasive weed. We do not want to see this again. The lakes were famous for all kinds of fishing before hydrilla and with native plants restored the lakes can again be a drawing card for fishermen and all other persons who want to engage in various kinds of recreation on our beautiful lakes.(Godfrey, S.)

Please do not stop this control of the weeds. (Simons, T.)

I am writing this letter to voice my support of the work you are doing for us to eradicate the weed problems threatening to choke the Santee Lakes. In 2006, after the hydrilla, Preston Clark broke the all time record by more than seven (7) pounds on his first visit to the Santee Lakes. I crappie and cat fish and I was recently asked by a fellow guide if I didn't catch more fish when we had the hydrilla The answer was a firm, "no." I support all efforts that prevent the hydrilla from returning to the lake, ruining it for all but a few. (Cagle, C.)

We have learned from several sources that an effort is underway to reintroduce Hydrilla to the Santee Cooper lakes, and fervently object to this proposal. There are enough problems encountered with other invasive plants and animals.

I understand that Santee Cooper and the South Carolina Department of Natural Resources have been hard at work to deal with this invasive species. We support this effort. (Gragan, D.)

I write on behalf of the Santee Cooper Striped Bass Stakeholders. The stakeholders have reviewed the Draft 2010 Aquatic Plant Management Plan and have asked me to express their unequivocal support. (Espey, J.)

We approve of your Aquatic Nuisance Species Program to keep the lake as clean as possible. (Andrews, P.)

My family is in complete and total agreement for SCDNR to suppress the growth of hydrilla in the Santee Cooper Lakes. (Locklair, K.)

We STRONGLY disagree with the initiative of SANTEE BASS MATTERS to reintroduce hydrilla to Lake Marion/Santee Please know that property owners on Lake Marion want the lake to stay clean and free of invasive weeds - especially hydrilla. (Thompson, S.; Thompson, T.; Thompson, A.; Thompson, R.)

Hydrilla may provide cover for bass but if you can't get your boat in the water what good is it. I strongly oppose any attempt to block the control of aquatic nuisances in the lake. (Rosser, C.)

I have read and would like to indorse the SCDNR plan to control aquatic plants in SC and in particular the Santee Cooper Lakes. (Littell, L.)

WE SUPPORT THE 2010 MANAGEMENT PLAN TO CONTROL INVASIVE WEEDS. (Harris, J.; Harris, A.; Wilson, W.; Chaplin, K.; Huttner, G.; Williams, L.)

please continue to spray for the reduction of hydrilla weed. I just want to make it known that I am in favor of spraying for aquatic weed. (Brady, J.; Varn, R.)

I sincerely appreciate the efforts of the council and DNR in using financial wisdom in order to meet the objectives of invasive species control in light of the current budget constraints on state and federal funds. As a South Carolina tax payer and the current President of South Carolina Plant Management Society, I support the plan as written. I would encourage you not to succumb to the pressures of this or any group who would try to destroy efforts to keep the waters of South Carolina fully functional. Allowing the re-introduction or spread of hydrilla or any other invasive species is not only illegal, but doing so to satisfy the desires of a few would be fiscally irresponsible for the whole.

In the plan, I noticed you have Floating Heart (Nymph ides spp.) listed as a target plant. Like hydrilla, it will become a problem if not controlled. (Feller, L. SC Aquatic Plant Management Society)

PLEASE CONTINUE YOUR EFFORTS TO KEEP HYDRILLA OUT OF LAKE MARION. IT IS IMPERATIVE TO THE FUTURE OF OUR LAKE, OUR LAKE AREA BUSINESSES & OUR LAKE PROPERTY VALUES. (Vandyke, C.; Stickles, V.)

I strongly support that portion of the plan to increase the use of Chinese Grass Carp to control the increasing growths of the non-native aquatic plant hydrilla in the Santee Cooper lakes. In the late 1980's through late through the late 1990's, hydrilla covered approximately 25% of Lake Moultrie and Lake Marion. This is something that must not be allowed to happen again. Experience has also clearly shown us that the only way to control hydrilla in these lakes is through the use of grass carp. By using low stocking rates which have been shown to be effective in controlling the regrowth of the plant, we can avoid stocking massive numbers of the fish to once again bring the plant under control. (Wagner, N.)

I would like to state my support for the 2010 SC Aquatic Plant Management Plan developed by the SC Aquatic Plant Management Council and SCDNR. (Adcox, Allen; Adcox, Jean; Anderson, Rachael; Ardis, Ashley; Ballard, Ronald; Ballard, Linda; Bell, Maureen; Booke, Jully; Bowick, Patrick; Bowick, Donna; Bozard, Bo; Brown, George; Brown, Dianne; Brown, Joni; Brown, Charles; Brown, Franklin; Brown, Judy; Butler, Michele; Cagle, Carl; Cagle, Carolyn; Carr, Fredrick; Catoe, Wayne; Catoe, Suzette; Chapman, Virginia; Chapman, RM; Christian, Mary; Christian, Curtis; Compton, Sherry; Conner, Thomeas; Connor, Deane; Cregan, Daniel; Curran, Charmie; Dailey, K.; Davis, Edward; Davis, Elizabeth; Dean, Brooke; Dehreus, WJ; Derr, Barbara; Downs, Barry; Durant, John; Edwards, James; Fletcher, Robert; Fletcher, Julia; Francis, Barbara; Furse, Judy; Gainey, Frances; Gainey, Harvey; Gainey, Wayne; Gainey, Brenda; Gainey, Keith; Gannon, Kelly; Geddings, Billy; Gleaton, Debra; Gleaton, E.V.; Godfrey, Cathy; Goodman, Al; Goodson, William; Gragan, Susan; Haley, Peggy; Haley, Randi; Hanna, Paul; Hatte, Charlie; Herbert, Eddie; Hodge, Brian; Hodge, Martha; Horne, Cathrine; Horton, Brock; Howe, Sue; Hubbard, Mike; Hubbard, Carolyn; Huff, Jeffery; Huff, Angie; Huff, Courtney; Hurst, Pat; Jenkins, James; Kelley, Hoyt; Kelley, Stephanie; Kelley, Ann; Kelley, Alfred; Kennedy, Von; Kimbrell, Tripp; Kinsler, Emily; Lane, Linda; Lemorie, Catherine; Lewis, Karen; Lockett, Mary; Logan, Teresa; Lookabill, Ray; Love, Bob; Love, Joy; Martin, Arthur; Maynard, Gail; Maynard, Rex; McCratchen, Craddack; McDonnough, Bob; Miles, Julie; Miles, DJ; Miles, Alene; Miles, Iven; Miller, Jennifer; Miller, Hugh; Miller, Christina; Mims, Wendell; Mints, Lisa; Mintz, Dan; Newman, Kevin; O'Neal, Doris; O'Neal, G; Odom, Larry; Odom, Alice; Osborne, Nikki; Osborne, David; Paccadori, B.; Pappas, Chris; Phelps, PD; Price, Larry; Prichard, Pete; Printzrow, Jay; Pritchard, Betty; Ptolemy, Dianne; Rauber, Linda; Reese, Jeannette; Reidy, Taylor; Richard, Celia; Richmond, Will; Rimer, Mindy; Rimer, Ricky; Rodgers, Jerry; Rodgers, Luanne; Rourke, Donna; Runyah, Marc; Schmitty, Mike; Sheek, Robin; Shriner, Mary; Shriner, William; Shuhan, Michael; Simpson, Grey; Singelton, Alice; Singletary, Mic; Smith, Susan; Smith, Joseph; Stackhouse, Dan; Steele, Chip; Stutts, Kristen; Sunderman, Edward; Sweat, Joel; Tapley, HL; Tapley, Catherine; Thames, , Jefferey; Thompson, Marilyn; Toporek, Matt; Vallieres, Juan; VanderBard, Ross; VonLinsome, Richard; Walker, Nelson; Warren, Harvey; Warren, Linda; Wilson, Jon; Wing, Robin; Wolter, Elizabeth; Wyndam, Shirley)

Aquatic plant management on the Santee Cooper lake system, as well as other public waters of the state, is carried out under the oversight of the SC Department of Natural Resources - Aquatic Nuisance Species Program. Federal, State, and local aquatic plant management professionals have worked together over the past three decades to remove this harmful, invasive plant from the Santee Cooper system, as well as from other lakes and reservoirs that have become infested.

The 2010 SC Aquatic Plant Management Plan proposes continued efforts aimed at controlling Hydrilla while enhancing native aquatic plant populations providing wildlife habitat and allowing for a variety of recreational opportunities for our citizens.

This effort has focused on maintaining biological balance and diverse recreational opportunities. Approval of the Draft 2010 SC Aquatic Plant Management Plan will allow for these efforts to continue.(Adams, John; Aldridge, R.; Allen, Joey; Anderson, Chris; Baggett, Kim; Baker, Letitia; Bakley, Karen; Baldy, Johnny; Balle, Michelle; Balrick, Trina; Barb, Susan; Barb, Raymond; Barker, E.A.; Barr, Matthew; Barr, Nancy; Baucom, Viola; Baurn, Robert; Beard, Betsy; Beckham, Marley; Beckman, Alan; Beckman, Billie; Bell, Charles; Benbow, Loretta; best, Arthur; Bevacgua, David; Black,

Brittany; Blakley, Linda; Blascak, Evelyn; Boudreau, Perry; Bowers, Donnie; Bowers, William; Brasington, Jeretta; Bratton, Ruth; Breitner, Bruce; Brixto, Mike; Broughton, Ted; Broughton, Vicki; Brown, Cory; Brown, Frances; Brown, Kenneth; Brown, Joni; Brown, Wanda; Brown, Bernie; Brown, Dwight; Brunson, D.; Brunswick, Gary; Bruzik, Martin; Bruzik, Sandy; Bryan, Jerry; Bryant, Randy; Burbage, Bill; Burns, L.; Burns; M.Buxton, Nancy; Cagle, Carolyn; Cagle, Carl; Cagle, Jill; Cagle, Carl; Cagle, April; Cagle, Kevin; Calloway, Ricky; Calters, Bobby; Camp, Delores; Campbell, Thomas; Campbell, Grover; Campbell, Grover; Canttey, Heather; Carl, Joseph; Carman, Kay; Carman, Jason; Carrio, Pauline; Carroll, Wiley; Carroll, Lynda; Cathern, Chris; Caycile, Keith; Chapel, Keith; Chapel, Anetta; Charles, Pamela; Chauver, R.J.; Chilst, Logan; Church, Ricky; Churty, Harry; Clelteirs, Del; Coffey, Juanita; Cogdill, Wendy; Coker, Amanda; Colclough, Albert; Cook, Hermin; Costa, Joe; Costa, Gloria; Coto, Robert; Coto, Diane; Creel, R.S; Cross, Charles; Cunningham, Ronald; Cunningham, Kent; Dalton, Robbie; Danner, Jason; Davis, Jeremy; Dayle, LeRoy; DeKalb, Robert; Denit, Clifford; Denning, Margie; Dennis, Ruthie; Dennis, Bobby; Dennis, Margie; Dennis, Jamie; Dewitt, Corrille; Dolgas, Sandra; Dolgas, Richard; Dorman, Pamela; Dow, Jerry; Drastura, Lilian; Duckworth, Bitsy; Dugan, Christina; Duncan, Sandy; Duncan, Ronnie; Edwards, Blake; Edwards, Jerry; Edwards, Brenda; Edwards, Trent; Elerts, Steven; Enzor, Martha; Erthley, Frank; Evan, William; Evans, Carl; Evans, Jonda; Ewen, William; Ezor, Kathy; Failmezzer, Suzanne; Feagers, James; Fincannon, Stephanie; Flowers, RL; Floyd, Earl; Floyd, Tonya; Folkers, Harriette; Formler, Nathan; Foster, Wesley; Foxe, Barbara; Foxworth, Keith; Fraraccio, Robert; Garlen, Bert; Gerald, Roger; Gibson, Nancy; Gilkers, John; Gleaton, Eddie; Gleaton, Debra; Gleaton, Meloyne; Glenn, Danny; Glenn, Mary; Godfrey, J; Goebel, James; Goldsbury, Ralph; Grate, Francis; Greenwell, Allen; Gregg, Richard; Gregory, W.T; Ham, Jerry; Hanna, Dale; Hanna, Debbie; Hanna, David; Hanna, Debra; Harkins, James; Harper, Andy; Harper, Sandy; Harrelson, Alice; Harrington, Walter; Harrison, Dolores; Harvin, Thomas; Hawlig, Fran; Hawthorne, D.A.; Hayes, Bobby; Hayes, Beth; Hayes, G.G.; Hayes, Melanie; Hayes, Chrystal; Hayes, Ladd; Haynacki, Judy; Heeton, Jeffery; Helton, Sherri; Herley, Sylvia; Hinds, John; Hinds, Winston; Hinds, Marlene; Hobbes, Myrtle; Hobbs, Kim; Hobbs, Rodney; Holaber, Katie; Holcombe, Jerremy; Holden, David; Holden, Phyllis; Holliday, William; Holt, Bob; Hooker, Robert; Hopkins, Ray; Huff, Shirley; Hughes, Dianne; Hulony, Don; Hunsucker, Dot; Hunsucker, Ed; Huston, Joseph; Hutto, Ray; Hutto, Bobbie; Ibert, J.; James, Matthew; Janic, Mike; Jarvis, Dwight; Johnson, W.; Johnson, Gloria; Johnson, Mitchell; Jones, C.; Jones, P.; Jones, Harvey; Joyl, Chan; Just, Amy; Just, William; Just, Pam; Justice, Jack; Keefe, Joni; Kelley, Ann; Kennedy, Susan; Kennedy, Neal; Kindle, Juanita; Kinman, Angela; Koranloo, Kamran; Krout, Alfred; Langston, Iris; Langston, David; Laslo, SJ; Lee, Marie; Lee, Kathy; Lee, Neil; Lelroy, Leonard; Lesemann, John; Lesemann, Linda; Lewis, Joy; Lewis, Stephen; Lewis, J.; Lewis, TR; Lewis, Thomas; Little, Robert; Londeree, Joe; Londeree, Jean; Lorthun, Phillip; Luis, Timothy; Luosrue, Danny; Lykes, Jamie; Lyons, Robert; Magnus, Ryan; Mahoney, Joe; Main, R.; Main, D.; Maletz, William; Martin, Christine; Mathis, John; Mathis, Matt; McCarthy, John; McCarthy, Betty; McDuffie, Scott; McElveen, Robert; McElveen, Brenda; McElveen, Lauri; McElveen, Barber; McElveen, Mike; McElveen, Frankie; McElveene, Luis; McPherarr, Melville; Mercer, Wanda; Milley, Jennifer; Moody, Fred; Moore, Jody; Morford, Charles; Morford, Betty; Morris, Dale; Morris, K.O.; Morris, Barbara; Moye, Joyce; Mozdehi, Louise; Mozhdehi, Bruce; Murley, Karen; Nadeau, Doris; Nadeau, Henry; Nethermann, Jodie; Newman, Claude; Newman, Faye; Norris, Edward; Norris, Francis; Norris, Tony; Obertacz, Carolyn; Odicher, E.; Odom, William; Odom, Marian; Outin, Michael; Outin, Pamela; Owens, Bobby; Pace, J.; Pallodimo, Michael; Parker, Kelly; Parker, Bret; Parker, William; Perkins, Lynn; Peyton, Sarah; Peyton, Donny; Plowden, Judy; Polk, Timothy; Poucee, Sandra; Powell, Annelle; Powell, Nelson; Powers, Ronny; Preston, M.E.; Prevatte, Harry; Price, Ronnie; Price, Robert; Prote, Vicki; Puin, Xavier; Quinn, Hazel; Ray, James; Ray, Margaret; Ray, Chris; Raybits, Pat; Raybits, Stan; Reaves, Jim; Reed, Leigh; Reeves, Darlene; Richburg, Terry; Rikalts, Robby; Robinson, W.; Robinson, Libby; Robinson, Becky; Robinson, Joyce; Robinson, Paul; Robinson,

Elijah; Robinson, Joe; Robinson, Raine; Rodgers, Harry; Rodgers, Michele; Rogers, John; Rolle, Jon; Ross, Bill; Rosul, L.B.; Rouse, Terra; Royue, Jesse; Rudman, Ronald; Samuels, Dona; Sarrio, Charles; Sauyir, Danny; Sayers, Danny; Schmag, Edward; Schrader, Harry; Schroeder, James; Schulman, Wendi; Schulz, Dina; Sebock, Joanne; Sebock, Randall; Sein, Parris; Seoulnil, B.; Sherma, John; Shumahe, Christi; Shumahe, John; Sigman, L.; Smith, Faye; Smultz, Kimberly; Sommers, Pamela; Stagg, Julia; Stanbelv, Gus; Stours, Debra; Suis, Susan; Sullivan, Brent; Summersett, Jerry; Summersett, Carla; Summersett, Carson; Summersett, Hunter; Swetham, J.; Talley, Marla; Terry, Jay; Thigpen, Cheryl; Thots, Bernie; Thysine, Dwayne; Timdall, Angela; Tomlinson, Jeromy; Truesdale, Harold; Tucker, J.R.; Turner, Clyde; Valdaliso, Darren; Varn, Gerald; Varn, Paula; VonLinsovch, Richard; Walker, Robert; Walker, Norvelle; Walters, S.; Ward, Kathy; Warren, Linda; Warren, Harvey; Watson, Leroy; White, Hallett; Wilson, James; Wilson, James; Wilson, Andy; Wise, Bridget; Worsham, Marion; Worsham, Freda; Wright, Jimmie; Wright, P.; Yaeger, Michael; Yaeger, Mary; Yailyer, Robbie; Young, Henry; Young, Margaret; Young, Francis; Young, Michael)

Response:

Contrary to some comments, SCDNR and Santee Cooper wholeheartedly agree that we need aquatic vegetation in the Santee Cooper Lakes to have a great natural resource. We also agree that vegetation absolutely needs to be of the native variety and not hydrilla. Eradication of established hydrilla utilizing current technology is virtually impossible. The goal of aquatic plant management on the Santee Cooper Lakes is to reduce hydrilla acreage while promoting a diverse natural habitat for fisheries, waterfowl and other animals. That goal is set forth in a Memorandum of Understanding between Santee Cooper and the SCDNR. The MOU provides for a minimum of 10% of the surface area of the lakes to be maintained with a diverse assemblage of native aquatic plants which includes a combination of submersed , floating leaf, and emergent plant species that provide habitat and food for game and non-game fish and wildlife species. According to last year's survey almost 17% of the Santee Cooper system has aquatic vegetation. This is well above the 10% minimum. Hydrilla, at its peak coverage, never covered more than 25% of the total surface area of the Santee Cooper lakes. At this level, the plant had a devastating effect on all lake uses and users. The proposed coverage figures of 20 to 50 % from some commenters represents coverage of between 28,569 – 80,240 acres.

In order to enhance native plant growth and habitat, innovative management techniques shall be utilized. These techniques will include introducing desirable native plant species, enhancing wildlife and waterfowl management areas and implementing strategic lake level management measures. Also included in the MOU is annual monitoring of the vegetative community and a cooperative effort to monitor the health of the fishery and waterfowl populations. The data derived from annual surveys will be utilized in an annual meeting between SCDNR and Santee Cooper to review the results of monitoring and treatment programs and to determine the effectiveness of the programs and to develop annual work plans.

Were too many carp stocked originally in the Santee Cooper system? The numbers stocked accomplished the task for which they were intended, i.e. to control the vast growths of hydrilla that infested the lakes at the time. We do not know if that level of control could have been achieved with fewer fish. The stocking rate that was utilized was developed jointly by the Army Corps of Engineers, the SC Water Resources Commission, SCDNR and Santee Cooper, utilizing the best information and research available at that time.

In the 15 years that hydrilla has been under control in the Santee Cooper system, the system has not experienced one single fish kill resulting from dissolved oxygen depletion; we do not have vast areas

of our lake becoming “dead zones’ in the late summer due to anoxic conditions; there have been no commercial boat landings going out of business as a result of restricted access; no farmers have had to fight to keep their crops alive due to clogged irrigation intakes; no industries have had to curtail or cease operations because of hydrilla clogging water intakes; mosquito populations are a fraction of what they were during the peak of hydrilla infestation, one reason that we still have not documented a single human case of West Nile virus or any other arbovirus illness in the area; we have seen a significant expanse of native submersed vegetation under the current stocking plan/rate; bass fishing organizations have set all-time national records for daily and tournament catch rates; and we are no longer deluged with angry letters and telephone calls from area residents, lake users (including fishermen and hunters), businesses and politicians due to the problems caused by the uncontrolled growth of the plant.

Furthermore, the lakes were never an "underwater desert" as many claimed. While the vegetation was significantly impacted, hydrilla especially, the system still had some vegetation which persisted. Aquatic plant coverage of the Santee Cooper lakes is determined annually through the use of an independent, third-party contractor utilizing aerial infrared and multi-spectral photography, followed by intense ground truthing verification. This effort, conducted since the mid-1980’s, represents the state-of-the-art in aquatic plant monitoring.” According to surveys done in that period of time (1999-2007) the lowest amount of vegetation was about 9600 acres in 2003, with only 1200 acres of submersed vegetation. From 2003 forward submersed vegetation increased yearly with 1700 acres in 2004 up to 7122 acres in 2007 system wide. While 2008 showed a decrease to 6360 acres of submersed vegetation attributed to the lack of water in a severely drought impacted system, 2009 brought almost 12,000 acres of submersed vegetation alone. Sterile grass carp are utilized so that we may control their numbers in the lakes and eliminate an overabundance. Current research shows that the carp have an approximate mortality rate of 32% per year. Grass carp have been in the system throughout the entire recent period of vegetation expansion. Some $400,000 was expended to determine the impacts of stocking grass carp in the Santee Cooper lakes, including impacts to fisheries, water quality, and vegetative coverage. Additionally, the U.S. Army Corps of Engineers developed and published a detailed Environmental Assessment for the use of grass carp to control hydrilla in South Carolina in both the late 1980’s and again in 2005. The EA considered impacts to native fish populations, water quality, aquatic plant populations, as well as tourism and recreation (fishing, hunting and boating). Among other positive findings, the EA states that “sterile grass carp provide a safe, cost effective means of controlling nuisance aquatic vegetation in South Carolina. DNR and Santee Cooper are committed to protecting and enhancing the native vegetation community. We plan to continue to monitor their status and take corrective action if unnecessary impacts occur.

Carp stockings mentioned in some of the comments were based on a 7 fish per 1 acre ratio. . Specifically, in reference to the Lake Yale, Florida stocking they eventually stocked (7/Acre) 28,280 fish for a 4,040 acre lake. Even at the lower density mentioned (3/Acre) in Lake Yale they stocked 12,120. One of the more common misconceptions is that we are stocking 8 fish per acre. That is not true. We are only proposing maintaining 20,000 (1 fish per every 8 surface acres in the system) carp for a 160,000 acre system. This should keep a modicum of control of hydrilla while allowing native species to flourish. So instead of a 7 to 1 ratio we are looking at a 1 to 8 ratio. One fish per 8 acres is less than 2% of the 7 fish per acre rate. Seven fish per acre is 56 times the rate we are proposing. This is why the current plan calls for an annual stocking of 6,400 fish in 2011 and beyond. This compensates for the expected annual losses in the 20,000 fish population. We believe that our proposed rate is appropriate for the dual objective of controlling hydrilla while allowing native vegetation populations to flourish.

Another point to address is the apparent confusion about the management or eradication of hydrilla and other 'grasses'. Some have expressed the desire to allow hydrilla growth in areas where its direct impacts would be minimized. Unfortunately this is unfeasible. The basic problem with invasive species is their tendency to spread and expand uncontrollably. Hydrilla, specifically has the ability to break off in large free floating tussocks. This fragmentation on both small and large scale is the plant's primary means of reproduction. It is therefore essentially impossible to contain hydrilla populations in pre-designated areas. Native species, on the other hand, tend to be far less aggressive and can usually be maintained in appropriate areas. Equally unfeasible is the total eradication of hydrilla. Once established, the plant can persist at low levels that are nearly impossible to remove completely with current technology. Therefore, management is the only viable option. The responsible management approach that we are proposing aims to minimize hydrilla while allowing diverse, native communities to exist. A common suggestion for allowing the growth of hydrilla in specific areas is to control it through precise chemical applications. This is the approach that was taken up during the early phases of hydrilla invasion in the Santee Cooper lakes. Unfortunately, the costs associated with the approach were far too high to sustain. In terms of acre by acre control over long periods of time grass carp stockings are more economical than chemical treatments.

Interest has been voiced in fostering appropriate vegetation communities to help fish and waterfowl populations. One fear is that herbicides, carp, or both are indiscriminate killers of beneficial vegetation. This is not the case. Appropriate use of these tools can lead to very selective control of problematic vegetation while allowing beneficial vegetation to remain. These points are considered in all aspects of vegetation management. Current habitat enhancement projects are focusing on plants that provide cover for small fish and food for waterfowl both directly and as substrate for invertebrates. Many of the plants that are chosen for these projects are low on the list of preferred grass carp food sources and are more resistant to herbicides than hydrilla. Grass carp will therefore not be directly competing with waterfowl and herbicides will not be indiscriminately destroying all vegetation and habitat. DNR and Santee Cooper are committed to providing quality habitat in the lakes to enhance both the fish and waterfowl populations. This is a goal that we share with the lake's sportsmen.

Some detractors have pointed to decreased license sales around the lake as evidence that the current state of the lake system has negatively impacted the area's economy. Licensing data indicates that, for the period of 2005-2009, there was indeed a decline in non-resident fishing license sales in the five county area surrounding the Santee Cooper lakes. The decline was 31.5%, not the "over 50%" cited in some comments. Many different factors could have contributed to this change in sales rate. This decline was partially attributed to the near record low lake elevations which the lakes experienced from mid-2007 through 2008. During this period, many of the commercial and public boat landings on the system were not usable and boating conditions were hazardous. Also, in 2009 the SCDNR went to a point of sale system which eliminated the hand written license sales and required a new point of sale system for all license vendors. This lead to a decrease in the number of license outlets in the counties surrounding the lakes. Furthermore the decrease could be attributed to the suppressed economy and overall uncertainty. Interestingly, non-resident fishing license sales increased in SCDNR offices and online significantly during that same period.

One clear and constant indicator of the economic impact of travel and tourism in South Carolina is the state's 2% accommodations tax, a fee imposed on the gross proceeds derived from the rental of any accommodation. An analysis of the accommodations tax collected in the five county area

surrounding the Santee Cooper lakes (all data provided by the South Carolina Department of Parks, Recreation and Tourism) indicates a steadily increasing trend in visitation and tourism based spending from 1988 through mid-2007 (an increase of 214%), followed by a significant decrease of some 10.7% from mid-2007 through mid-2008 (the only year of decrease over a 20 year span). As was the case with the sales of non-resident fishing licenses, the decrease in the rate of tourism in the area was most likely the result of the near record low lake elevations which occurred during that same time period. Essentially, it resulted from the lack of water, not the lack of hydrilla or fish.

Plan Modifications:

Change: Lake Marion and Lake Moultrie

Rate of control agents to be applied

Triploid grass carp

Lake Marion and Lake Moultrie will be carefully monitored for additional increases in hydrilla acreage. Herbicide treatments will be used to provide temporary control until results from grass carp feeding become apparent. Changes to the maintenance stocking strategy will be considered if survey results, regrowth, **or habitat loss** warrant.

Change: Lake Marion and Lake Moultrie

Long term management strategy

a) Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in **a minimum of** 10% of the total surface area of the lake and to effectively control non-native invasive species.

Change: Appendix E

This should be changed to reflect the new agreement which has been agreed upon by Santee Cooper and SCDNR.

Lake Greenwood: The total number of comments received was one, which supported the plan but was concerned that not enough was being done in a specific area on the lake.

Commenters: Fred Herman

Comment:

Having reviewed the content of the Lake Greenwood plan I have noticed one item. Your plan indicates the following goal.... *Eliminate hydrilla from Rabon Creek arm and around Greenwood State Park.*
However I reviewed the map that indicates where the lake will be treated and it shows only the upper Reedy River arm **and not** the Rabon Creek arm. I live on the Rabon Creek arm and we have been treated over the course of the last several years. I feel that we still have some problem in Rabon Creek and would like to think that this area will still be treated in the future as to stop any spread. I think both arms require treatment. ... (Herman, F.)

Response:

We agree that that there is still a very real threat of invasive plants occurring on the Rabon Creek arm of Lake Greenwood, especially on the shallow deltas that you mentioned. A herbicide

treatment in 2008 greatly reduced the hydrilla population in the Rabon Creek arm. The area was surveyed periodically in 2009 in order to provide a rapid response in case the hydrilla began to repopulate the area. Also, sterile grass carp were placed in the vicinity to try and control any unwanted growth that may have occurred. Let me reassure you that in 2010 the Rabon Creek arm of Lake Greenwood will not be neglected. This year the SCDNR is proposing to place more grass carp in the areas where hydrilla is typically present, including the Rabon Creek area. We will also continue to monitor the area on a regular basis.

Plan Modifications:

None at present.

Summary of Public Comments, Responses, and Plan Modifications to the Draft 2009 South Carolina Aquatic Plant Management Plan

Santee Cooper Lakes:

Commenters: David E. Sweat, Philomena A Volpe

Comments:

I along with several others are in agreement with the invasive weeds being sprayed in the Lakes, however we are concerned about several issues that we feel are not being considered. Most of these issues are from anglers and guides! (Sweat)

The time frame for spraying is proposed during the spawning periods for fish, almost all fish in the lakes will be spawning and in the shallow areas to be sprayed. (Sweat)

By spraying the baby leaves, or non-permanent leaves the plant species will not be killed. Thus spending money wastefully and having to repeat the spray. By repeating, the poison levels will be higher causing fish to die. (Sweat)

Certainty of poison's used vs. eco-system damage is not known. How will it effect the shell fish in the lakes? Will rain and rain run-off's dilute the formula used, or will the formula dissipate when subjected to large quantities of water (remember the Lake waters are used for drinking purposes). (Sweat)

Another concern is Grass being engulfed in the turbines, once the spray does the job on the plant, the plant will die off, breaking off and have a larger chance of being engulfed in the turbines, how is this going to be resolved? (Sweat)

Remember if it can travel down stream, it will also travel out the locks into the ocean, so if the toxin used or the plant survives down stream, now the plant is given an opportunity to spread to other areas. (Sweat)

I see no action taken for the Lizzie Creek area. In the last two years, I'm assuming because of the drought we have had a severe problem with invasive weeds in our area. You could not maneuver your boat 50 yds without stopping to get the hydilla off the motor. Due to the water levels both high grass weeds and hydrilla have been out of control since at least March of 2008. The motoring up our canal to the Wyboo area is dangerous as it is with the stumps, the weeds only add to

dangers. If you could please consider our Lizzie Creek Area in your controlled plan it would be greatly appreciated. (Volpe)

Response:

The Draft 2009 Aquatic Plant Management Plan proposes a maintenance stocking of sterile grass carp in the Santee Cooper Lakes in 2009 The Aquatic Plant Management Council is committed to maintenance stocking of triploid grass carp in the Santee Cooper Lakes to provide long-term control of hydrilla and to help alleviate the need for extensive herbicide treatments for hydrilla control. Most spawning activities are in the early spring before most herbicide treatments occur. All of the herbicide used in any reservoirs or lakes is labeled for use in South Carolina waters by both the U.S. Environmental Protection Agency and Clemson's Department of Pesticide Regulation only after extensive assessments have been completed. They are applied by licensed professionals with great care not to exceed the limits of the label. EPA registration of pesticides intends to promote the safety and well-being of public health and the ecosystem. More specifically, each year a letter is sent to SCDHEC, Bureau of Water which oversees drinking water supplies in SC outlining the specific use of these herbicides and includes detailed planned treatment precautions even though all treatments are a significant distance away from any potable water intakes.

Most of the shellfish you refer to in the Santee Cooper Lakes is itself an invasive species. *Corbicula fluminea*, Asian clams, have become the dominate freshwater mollusk. We are not sure of the overall ecological impact of these clams in South Carolina waters and most are only affected by significant concentrations of chlorine or bromine in the water column. Aquatic herbicides also are very soluble in water, disperse readily to very low level concentrations, and have a very short lived half life.

Lizzy Creek is not a sub-impoundment but a cove off of Wyboo embayment on Lake Marion. The plant that you are referring to is water primrose not hydrilla. Santee Cooper has it in their plans to treat that area this year as soon as the plant is at the proper growth stage.

Plan Modifications:

None at present.

Summary of Public Comments, Responses, and Plan Modifications to the Draft 2008 South Carolina Aquatic Plant Management Plan

Lake Murray:

Commenters: Grayson Mathis

Comments:

Why is the state pouring more money into fighting the "weed" problem? Is it because of pleasure boaters and jet skiers who are too lazy to go around the weeds? Why does the DNR constantly comply with whatever these well-to-do people want, rather than focus on what is best for the NATURAL RESOURCES. Look at the state of Georgia, they are not killing off their fisheries by taking out the weeds. Since you have killed the hydrilla in Lake Murray, the fishing is getting worse. Tournament weights are down, considerably. This is a major problem since fishing is a large, large portion of the attractiveness of the Lake Murray region. I just don't understand why the DNR continuously pursues these pork belly projects to make a few people happy. You should be focusing

on what your job title is, dealing with natural resources, not destroying them because those with money want.

Response:

The budget for 2008 of $760,000 is lower than the average cost in the 90's of 1.484 million dollars spent per year. The budget has decreased in part because early detection and proactive management techniques have kept invasive species in check. Municipal water intakes, recreational activities, hunting, fishing and various other water uses are affected by invasive species in South Carolina The Aquatic Plant Management Program tries to take into account all of the varied uses of our waterways when determining management methods. In all cases an integrated, balanced management approach is used to minimize impact to the habitat of South Carolina waters while aggressively pursuing control of any federally and state listed invasive species.

There is no plan to stock grass carp in 2008 for Lake Murray and only a limited number of acres in the plan for primrose control. A late fall survey showed no appreciable hydrilla, so a dramatic increase in that acreage would have to occur to even consider stocking more carp The information in the 2008 plan pertaining to triploid grass carp stockings for hydrilla control is part of an early detection, rapid response protocol for long term control of hydrilla in Lake Murray.

The state of Georgia does indeed use and recommend aquatic weed control methods using triploid grass carp in several lakes. Georgia has also recently created the Georgia Exotic Pest Plant Council in response to increasing awareness of non-native invasive species. Hydrilla is listed as one of their most problematic invasive weeds.

Tournament weights were up in the last major tournaments held at Lake Murray. There were four new records set at the February 2006 FLW tour event held on Lake Murray which occurred after the 2003 stocking. Inspection of BASS events from 1991 to 2006 on Lake Murray has shown that the tournament weights appear to have remained fairly constant. In addition, SCDNR Fisheries biologists have stated that Lake Murray was at or above average when looking at the condition factors for largemouth bass, their population numbers were at favorable levels as well and the overall health of the system is good for a large impoundment with other fish species also having healthy populations represented.

Plan Modifications:

None at present

Summary of Public Comments, Responses, and Plan Modifications to the Draft 2007 South Carolina Aquatic Plant Management Plan

Santee Cooper Lakes:

Commenters: Hunter Suggs, Rep. Phillip Lowe

Comments:

"I am in complete opposition to releasing any additional carp into the Santee cooper Lakes. Ever since the original stocking occurred, ALL of the native and non-native grasses and vegetation

disappeared, and the Upper End of Lake Marion has become a mud hole. The ducks that used to winter in this area do not visit "The Swamp" anymore. Please do not release any additional carp into the Santee Cooper Lake System." (Suggs)

"Aquatics do not currently pose a problem. Your previous overstocking hurt waterfowling and fishing. You have proved you can stock enough to control vegetation. The vegetation you state has recovered is not hydrilla Let more vegetation return. Do not restock yet!!!" (Lowe)

Response:

The original grass carp stocking between 1989 and 1996 added over 760,000 sterile grass carp to Lakes Marion and Moultrie. That amount was needed to control the 48,000 acres of hydrilla that was present at the time. That multi-year stocking was successful, but after hydrilla was controlled the fish also impacted desirable native vegetation. That was ten years ago and since then the number of grass carp have declined to about 5,800 fish and beneficial vegetation has come back. Native vegetation has shown a 60% increase in acreage from 2005 to 2006 for a total of 12,960 vegetated acres. Total vegetative coverage now is conservatively estimated at 3 % in Lake Marion and 2% in Lake Moultrie based on annual aerial surveys and photography. Some hydrilla is beginning to return in the main lakes. To avoid the occurrence of widespread hydrilla infestations again in the Santee Cooper Lakes, a small maintenance stocking of sterile grass carp is needed. The maintenance stocking plan calls for adding a small number of grass carp to the system to equal the number present at the beginning of 2006 when hydrilla was under control yet native species were present (8,200 fish). That additional number is 2,100 fish in Lake Marion and 520 in Lake Moultrie. This is a very small number of grass carp for a lake system that is over 170,000 acres in size and about one percent of the original stocking. The proposed stocking plan was reviewed and approved by DNR fisheries and waterfowl biologists to help ensure the protection of fish and wildlife populations. In addition to the maintenance stocking; the plan calls for efforts to increase habitat by promoting vegetation beneficial to wildlife and waterfowl through other habitat enhancement projects. Those efforts include the planting of desirable native plant species, improvements to the current WMAs, and additional support for the Santee National Wildlife Refuge.

Plan Modifications:

None at present.

East Branch of the Cooper River:

Commenters: Tommy Kellum

Comments:

"My concern is the East Branch of the Cooper River and the adjoining rice fields and French Quarter, Quemby, and Huger Creeks. I reviewed your Management Plan Draft and it stated that the coverage was approximately 3000 acres. If this is referring to weed coverage it is highly under estimated. I live on French Quarter Creek and I see air boats spraying approximately every other year. The weeds are closing off virtually all adjoining creeks and rice fields. It appears that after the weeds gain control then silt fills the creeks even further. Your draft mentions the use of carp in the Santee

cooper lakes as one method of control. What other options are there for the creeks besides spraying? If there is none, what would be the effects of spraying more often? Recreational use is on the rise and our useable water area has greatly been reduced over the past ten years." (Kellum)

Response:

The main aquatic weed problem in the creeks you refer to is the growth of water primrose and water hyacinth. Neither of these plants can be controlled by grass carp. Other biological controls are available for water hyacinth but have not been successful in this part of the country. So there aren't many options for the creeks along the Cooper River except for herbicide application. In trying to manage a complete system, one must start small by treating the main channels and creeks most used by the public. After a certain level of control is established then efforts can expand to include the smaller creeks. Timing, water levels, and available funding play a crucial part in all control efforts. Additional herbicide treatments are possible if additional federal, state or local funding were available. We are committed to a systematic approach where control efforts are focused on the areas of greatest public use first then expanded into adjoining creeks where public use is less.

Plan Modifications: None at present.

Summary of Public Comments, Responses, and Plan Modifications to the Draft 2006 South Carolina Aquatic Plant Management Plan

Note: All comments received refer to Lake Murray. No other comments were received.

Lake Murray:

Commenters: Sam Gustafson, George King, Roy Parker, Herlong (cherlong@greenwood.net), John & Heide Hoppe, Robert Shealy Jr., Robert King, Roger Becker, Julius Bell, Billy F. Peake, E. Gobbel, Mr. & Mrs. Henry Blakewood, Mary Autrey, Martin Blackford, Charles F. Noll Jr., David McElyea, Don & Deloris Rains, Michelle Elles, Jimmy & Cathy Woods, Harvey Cubb, Robert Rucker, Bernard H. Long, Hans N. Fagg, Tom & June Schmitt, Benji & Joe Barnhill.

Comments:

300 acres...that's real impressive. As I recall prior to the carp the coverage on Lake Murray was several thousand acres. Congratulations and thanks to you and SCDNR for on a great job! (George King)

The 2006 Aquatic Plant Management Plan for Lake Murray looks fine to me. Thanks for the work you do to prevent the spread of invasive species of aquatic weeds. I think the grass carp stocked in 2003 have done a wonderful job of controlling hydrilla and Illinois Pondweed. Keep up the good work! (Parker)

We are concerned about the influx of weeds that prevents enjoyment of the lake. The plan calls for 4300 acres to be the trigger point for control action to begin. This is too high of a level to begin control actions. (Gustafson)

THE PURPOSE OF THIS LETTER IS TO MAKE IT CLEAR THAT THE HYDRILLA IS NOT GONE ... IT HAS JUST MIGRATED TO A TWO MILE LONG COVE WHICH IS SANDWICHED BETWEEN HIGHWAY 378 AND

HORSE CREEK RD. The water adjoining our property had no nuisance vegetation until after the long drawdown for construction of the back-up dam. When the water returned in 2005, most of the cove quickly filled with hydrilla and a little water primrose. Because hydrilla is a perennial plant and because there are certainly tubers under the water and in the mud, we expect the hydrilla problem to explode when the weather warms. The property owners in this area of the lake need a three prong attack. Probably most importantly, we need to be scheduled for sterile grass carp stocking before the weed Gets a full grip on the cove this Spring. It would seem that early use of the appropriate herbicide might also help curtail the invasion. Finally, we may need commercial mechanical removal this Summer. (Hoppe, Shealy, Robert King, Becker, Bell, Peake, Gobbel, Blakewood, Autrey, Blackford, Noll, McElyea, Rains, Elles, Woods, Cubb, Rucker, Long, Fagg, Schmitt, Barnhill)

I think the drawdown alone was enough to control hydrilla for a couple years. Why didn't we learn a lesson from the effects of eradication of hydrilla from Santee? Total elimination has a negative affect on fishing and ducks. Why not find a balance? Hydrilla as we speak is no longer in Lake Murray. Why have a control plan? You have succeeded in killing it all and it can't come back with all the carp. (Herlong)

Response:

Even though no hydrilla was found in a late fall survey it shouldn't be taken for granted that it is gone. The carp and the drawdown both helped to control the hydrilla and pondweed problems that were being experienced on the lake. However, hydrilla tubers and pondweed seeds are still viable and abundant in Lake Murray. The goal is to provide long-term control of these invasive species, which will take several years to fully assess.

The trigger mechanism of 4300 acres of hydrilla only applies to use of grass carp. Other control activities may be initiated at lower infestation levels. This year's plan is consistent with the 2005 plan. The 2006 plan calls for no stocking of grass carp on Lake Murray unless hydrilla coverage exceeds 4,300 acres above the 330-foot contour at which time the Aquatic Plant Management Council may reconsider the need for additional grass carp. A late fall survey showed no appreciable hydrilla, so a dramatic increase in that acreage would have to occur to consider stocking more carp. However, this year's plan does include the option of select herbicide control around municipal water intakes and high traffic landings if needed.

A survey of this area by SCDNR staff and discussions with SCE&G staff familiar with the area in question indicate that a plant other than hydrilla caused the problem. Water primrose and different terrestrial vegetation are routinely being confused with hydrilla. The drawdown exposed a lot of unvegetated shoreline where water primrose quickly spread and re-established at the 345-348 foot contour level. Water primrose is normally a shoreline species. It extends out into the water but is rooted close to the shoreline. While this plant can be invasive and cause localized problems, it has been in the lake for decades and is typically not a threat to general public access and use of the waterway. Based on past experience, it is expected that most of the plants that are rooted in deep water will not survive after the lake level returns to full pool. Another problem associated with primrose control is that all available herbicides require some set back or water use restriction for

irrigation or potable water. Therefore, there are no plans to control its growth this year. However, the SCDNR and SCE&G will monitor aquatic plant growth in this area and reconsider control options as needed.

Drawdowns have a limited effect on hydrilla. Normally for 2–3 years after a drawdown, the zone where the drawdown occurred has little hydrilla growth. However, large amounts of hydrilla still existed in the areas below the drawdown level and still presented major problems. Although hydrilla was under control last year, a plan is needed to address the potential for regrowth of hydrilla and Illinois pondweed this year.

Plan Modifications: None at present.

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